

# COMPUTERWORLD

## The Unix PC allure

DOS frustration forces R&D to 'open systems'

BY JAMES DALY  
CW STAFF

While DOS may still rule the roost when it comes to corporate desktop operating systems, personal computer software houses are heeding the call of open systems and are increasingly renegeing their research dollars toward that old standby, Unix.

Many developers, frustrated with what they call the proprietary limitations of DOS and the muddy flow of OS/2, are using Unix to cover their bets.

"Unix is no longer just for techies," said Dave Proctor, vice president of the database division at Ashton-Tate Corp. in Torrance, Calif. "Unix is moving rapidly toward the commercial market, and we intend to be ready for it."

Proctor said Ashton-Tate will deliver Unix versions of its Dbase IV database application for Sun Microsystems, Inc. workstations and systems using The Santa Cruz Operation's Unix version by the end of the quarter — before a product for the Apple Computer, Inc. Macintosh even arrives.

A variety of general user interfaces offering point-and-click

Continued on page 14

## Bush to push work-at-home

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — Some time in the next few months, President Bush is expected to deliver a public endorsement of telecommuting as "good for business" and good for relieving the nation's traffic, energy and pollution problems.

The president's staff has prepared an upbeat, one-page statement about work-at-home arrangements and is just waiting for the right time to go public, according to William Eagle, a staff member at the White House Office of Policy Development.

The White House endorsement may "open some corporate eyes" and foster a climate in which more companies are willing to try telecommuting on an experimental basis, said Emi-

### Home work

The number of company employees working at home during normal business hours is estimated to have increased 20% in 1990

Number of U.S. telecommuting employees (in millions)



Source: Lark Research Corp.

\*Projected

ly Bassman, manager of human resources planning at Pacific Bell in San Ramon, Calif. Pacific Bell has more than 1,000 managers who telecommute at least one

day per week.

An early draft of the presidential statement praised the ability of "computer and facsimile technology to move work to the people rather than moving people to the work. 'Cars that don't leave the garage don't pollute the air or congest the freeway,'" it said.

The Bush administration has already launched a pilot "flexi-place" program for the federal government, which will assess the costs and benefits of telecommuting for as many as 2,000 federal employees.

The president's support may turn the federal government into

Continued on page 4

## Hackers draw stiff sentences

Jail time sounds sharp note on tampering

BY MICHAEL ALEXANDER  
CW STAFF

ATLANTA — The Nov. 16 sentencing of three computer hackers to terms in federal prisons and substantial restitution payments is the long-awaited stem warning that is needed to help quell high-tech tampering, law enforcers said.

Adam E. Grant, 23, and Franklin E. Darden, 24, each received a sentence of 14 months incarceration, including seven months to be spent in a halfway house. Robert J. Riggs, 22, received a 21-month jail sentence. All three were ordered to make restitution payments of \$233,000 each.

The three hackers were charged with repeatedly breaking into computers owned by BellSouth Corp., eavesdropping on telephone conversations and stealing proprietary information, which they shared with other hackers.

The Chicago U.S. Attorney's office prosecuted Riggs on a separate charge for stealing a test file describing the operation of a BellSouth 911 enhanced emergency system and uploading it to a bulletin board in Illinois. The Atlanta sentence included the Chicago charge.

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## JAPAN'S MAINFRAMERS Long-term global strategies unfold

BY JEAN S. BOZMAN  
CW STAFF  
and LORI VALICIA  
ING NEWS SERVICE

Japanese mainframe manufacturers, who have patiently sold their products through U.S. and European distributors since the 1970s, are preparing to step onto the European and U.S. playing fields to sell their computers directly to information systems managers.

Japanese mainframe makers will weave themselves into the global market fabric starting in the mid-1990s, industry analysts said. "They are expanding at a time when others are pulling back.



But taking market share will be a gradual process," said Mike Jeremy, an analyst at Faring Securities Ltd. in Tokyo.

"The international mainframe market should be a big part of our overall business," said Saji Endo, overseas operations manager at Hitachi Ltd. in Tokyo. "But so far, we haven't sold many computers outside Japan. Our overseas mainframe business will be better in 10 years. We're waiting for the end of the current down cycle and for open systems to take hold."

Hitachi and its smaller counterpart, Fujitsu

Continued on page 100

## Internet privatization adrift

BY J. A. SAVAGE  
and KARY H. ANTHES  
CW STAFF

Internet, the giant globe of research-oriented, networks used by 3 million people in 35 coun-

tries, is evolving — perhaps chaotically — from a government-subsidized entity into a commercial one. Users and observers of the network like the change to turning around a steamship with no captain to steer it — only tugboats pulling and prodding, sometimes in different directions.

The U.S. Senate recently passed a bill to partially fund a commercial replacement for Internet, but Congress plans to play a limited role in sorting out commercial issues, leaving them to users, commercial interests

and the federal agencies that now have responsibility for the Internet backbone.

Internet is about to achieve a critical mass in which growing use attracts commercial interests. "The telephone companies originally perceived no market, so the government has been in market-building mode for years," said Stephen Wolff, a division director at the National Science Foundation. "Now it's beginning to look interesting."

While most observers have no objection to "commercialization" of Internet, they said it raises difficult and troublesome issues that have not begun to be

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**Executive Report** — The times demand greater versatility from IS staffs. Page 61.

**As it did with the 386SX**, Intel is expected to bring out a lower-cost, technologically revised version of the 486 chip next year. Page 6.

**DEC closing Phoenix plant** may have to target its first official layoffs. Page 8.

**Stock exchange automation pioneer** Mario Jo Moccia died at age 55. Page 8.

### Time of reckoning

Increasing Unix presence on the desktop is attracting software firms

Number of PCs shipped running Unix



\*Projected

Source: Datapoint, Inc.

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- 8 Pioneer of stock exchange automation Mary Jo Moccia, 55, dies of a heart attack.
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- 100 Fujitsu Chairman Takuma Yamamoto speaks candidly on the No. 1 Japanese mainframe maker's global strategies.
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## Quotable

"Hackers are trying to use the telecommunications industry as their playground. Well, the playground is closed."

WILLIAM COOK  
ASSISTANT U.S. ATTORNEY

On the sentencing of three hackers. See story page 1.

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# EXECUTIVE BRIEFING

■ Telecommuting is about to get a boost from the Bush administration. The White House has prepared an upbeat endorsement of flexible work arrangements to be delivered by Bush sometime in the next few months. As many as 2,000 federal workers are already using telecommuting in a pilot program the government praises for saving energy, reducing air pollution and retaining employees. Page 1.

■ Japan's mainframe vendors are becoming much more aggressive in the U.S. and Europe. While the overall mainframe market is softening, Hitachi and Fujitsu hope to boost their combined worldwide market share by 10%. Fujitsu's chairman says his company's Unix offering is an important market differentiator. Meanwhile, Bull's chairman denies press reports that Japan's NEC will increase its ownership of the struggling French vendor. Pages 1, 4, 100 and 101.

■ Adaptability has become the most sought-after qualification in IS employees. Tightening budgets, escalating demands and architectural changes all require a high degree of flexibility in IS personnel. Page 61.

■ Staff federal prison terms for three hackers convicted in the BellSouth case are seen as a long-awaited deterrent to serious computer crime. Legal experts say the sentences show a new focus on the intent of hackers, which in this case was serious damage to BellSouth computers and data. Page 1.

■ Midwest Stock Exchange IS chief Mary Jo Moccia died earlier this month on a business trip. Moccia, 55, was considered a pioneer in financial automation. Page 8.

■ Life along the Mississippi means disaster recovery precautions for data centers in the region, predicted to be the target of a major earthquake next week. Firms from Illinois to Arkansas are playing "better safe than sorry" with hot-site backups at the ready. Page 99.

■ A massive data center consolidation project is in the home stretch at First Interstate Bank. When completed, the project will have reduced 11 data centers to three, with predicted savings of \$40 million per year. Page 6.

■ On-line transaction processing is much more

than hype — it is a technology that meets business needs in a fast-paced marketplace. Page 29.

■ Too many IS departments are run like a "central Soviet," says one consultant who advocates dispersing more power and planning to consumers. Page 51.

■ Outsourcing has generated a slew of buzzwords, and many of them are obscuring true motivations and side effects. Page 56.

■ Is telecommuting appropriate for IS pros? The answer depends largely on the attitudes of firms and managers. Page 84.

■ IS veterans face harsh reality as their profession calls for more business know-how. The choice is cut-and-dried: Retrain or be replaced. Page 96.

■ On-site this week: Ethernet is creating happy LAN-dings at Canadian Airlines International in Vancouver, B.C., and Toronto, where pilots and mechanics train in job-related network-based facilities that cut simulation costs. Page 45.

■ The new baby at Gerber in Fremont, Mich., is an IBM AS/400, but the IS staff has found the System/36 replacement to be a mixed blessing. Page 33. Remote computing takes on a new meaning on the floor of the Pacific Ocean, where marine biology researchers took a customized Compaq laptop underwater to study the behavior of stingrays. Page 41.

## The 5th Wave



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	ANSI SQL	✓	✓
	FIPS		✓
	SAA	✓	✓
	NAS		✓
DISTRIBUTED DATABASE	Remote Request	✓	✓
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Which leaves just one question for everyone who's still patiently waiting for IBM...

*What are you waiting for?*



**COMPUTER ASSOCIATES**

# Intel readying downscale 486

Company working toward creating affordable multiple-level 486 chips

BY MAURA J. HARRINGTON  
CW STAFF

SANTA CLARA, Calif. — Intel Corp. confirmed last week that it is working to expand its 486 microprocessor product line downward next year. Analysts said the company is intent on keeping upcoming 80386 chip makers at arm's length from being serious competitors.

Although a 50-MHz version of the 486 chip has been widely discussed, Thomas Macdonald, Intel's marketing manager for the 386 and 486 product lines, said Intel will introduce new versions of the 486 chip on both a higher and lower level than what is being marketed today.

"We are going to push prices down in a way to make it more affordable to the user to put a 486 on their desktop," Macdonald said, adding that Intel will offer solutions on the 486 level similar to those available today on the 386 level.

In the face of anticipated 386 clone chips from Advanced Micro Devices, Inc. and others, analysts predicted last week that Intel may be developing alternative 486-level chips to move users toward higher-end products, as it did with its 386Sx campaign a little over a year ago.

**Price comparable to 386**  
Although Macdonald declined to map out any more specifics on the product expansion plan, semiconductor analyst Michael Stater, editor and publisher of "The Microprocessor Report," a periodical published out of Sebastopol, Calif., said, "Intel will probably make a 486 chip with no floating-point processor" at a price competitive with that of its 386 chip.

In October 1989, Intel began a nationwide, multimillion dollar campaign to introduce its 386Sx microprocessor — a hybrid 16- or 32-bit chip at the price of a 16-bit or 286 chip. The campaign, marked by advertisements with a large red "X" painted over the 286 numbers, caused 286-based

Dean McCarron, an analyst at In-Stat, Inc., a market research firm based in Scottsdale, Ariz.

"There is definitely a demand for a less expensive 486 alternative... and I'm sure that if Intel were to develop one, users would jump to it," McCarron said. "I see this as a tactical

## Sales tally

Sales of systems based on Intel's 486 have barely begun to take off in comparison to the 80386 and 386Sx, according to a survey of computer stores

	Unit sales			
	1989		1990	
	Q4			
486	159,804	136,675	498	2,355
386Sx	133,694	121,798	161,335	3,702

Source: Semiconductor, Inc.

CW Chart: Paul Mack

computer sales to plummet, industry analysts said.

The campaign had an impact on the way users purchased computers, as well as on the decrease of 386-based computer sales, said JoAnn Stahl, president of Dallas-based market research firm Storeboard, Inc.

However, Macdonald said last week, Intel's incentive in introducing multiple-level 486 chips is not to drive out its highest selling microprocessor.

"The 486 will not outstrip the 386 next year by any means, and there certainly won't be a campaign to wipe out the 386 chip," Macdonald said.

Nevertheless, in order to push users into spending the money on an even higher-level product, the price of 486-based computers still has to drop. This means the price of the CPUs must also drop, according to

move for Intel as well," he added.

Joe Brooks, manager of computer operations at the Pacific Stock Exchange in San Francisco, said the price of 486-based computers would have to come down close to the level of 386 personal computers before he would consider upgrading in the near future.

"Currently, we have 386-based PCs installed here, and we have no plans to upgrade to 486 at this time, but we would look at an alternative if it were [a 486-level computer at a 386 price]," Brooks said.

So far, Intel is the only company with the rights or technology to market a 386 microprocessor, but analysts claimed that the situation will probably change over the next few months, loosening Intel's monopoly.

Chris Worrall, director of intermediate systems marketing. The HDS models were changed only slightly, with performance

**OUR ENHANCEMENTS** happen to result in a better alignment to IBM's airframe machines."

CHRIS WORRALL  
HITACHI

of the EX 11 now just 1.09 times that of the older EX 10; the high-end EX 42 is 1.24 times that of the older EX 38.

HDS is targeting the estimat-

ed 30,000 IBM 4300-class sites worldwide, providing the only counterpart to the air-cooled portion of the IBM ES/9000 family.

"HDS realizes that IBM salespeople are doing a lot of market development for them by talking up the air-cooled ES/9000," said Peter Borris, director of the IBM Advisory Service at International Data Corp. in Framingham, Mass. "HDS is really the only other game in town, because AMDahl Corp. doesn't ship equivalents to the low-end ES/9000 computers."

Based on a combination of emitter-coupled logic and CMOS chips, all the HDS machines can be outfitted with a main memory of 512M bytes — twice the standard 256M bytes shipped with

# First Interstate nears end of consolidation

BY PATRICIA KEEFE  
CW STAFF

HOUSTON — When 80 information systems employees close the doors for good on a First Interstate Bank data center here last next year, the action will also close the books on a three-year effort by the bank's parent to consolidate 11 regional data centers and one backup site.

In addition, the banking group will shutter a warm backup site in California.

So far, the Los Angeles-based parent, First Interstate Bancorp., has closed seven data centers, averaging a savings of about \$40 million dollars per year, said Hayden Watson, group manager of the Operations Group at First Interstate in Houston and a member of a corporate-wide task force on standardization. "It's a staggering annuity, mostly from eliminating redundancy," he said.

Concurrent with the 1991 merger of the Houston-based data center into three other data centers in Arizona, Oregon and California, First Interstate will undertake a series of application conversions as part of a company-wide effort to move all 22 affiliate banks to a consistent platform.

"Because of the conversions, some affiliates may endure service cutbacks in IS personnel as older applications are jettisoned and replaced with standards, a bank source said.

"When we talk about consolidating, we're not just relocating existing equipment. We're talking about 10 to 12 systems conversions going on simultaneously over the next year," Watson said.

For example, the banking group's policy committee for operations and information services has settled on one consumer loan and one general ledger application standard. The committee is made up of data processing and other senior-level executives.

the low-end IBM ES/9000 machines, Worrall said.

The revamped EX line includes enhancements in the areas of memory management, capacity and peripherals attachment. The machines support up to eight optical channels; previous low-end EX models supported only four direct-attached optical channels.

The new EX models also support logical partitioning of main memory into real memory and expanded memory or a combination of both. Pricing on the low-end EX models is designed to be

To pull off the conversions, it is important that First Interstate retain its IS staff until the end of 1991. Watson said the bank hopes to do this via a combination of a generous severance package and a "retention-type bonus." A minimum of 60 days' notice is guaranteed to any affected employee. To ensure that most stay, the size of the severance package is reportedly tied to the length of time the employee remains with the company. So far, only three employees have resigned.

On Aug. 15, First Interstate's 119 Houston-based IS employ-

**WE ARE CONFIDENT WE will not see a reduction of service or responsiveness."**

HAYDEN WATSON  
FIRST INTERSTATE

ees were summoned to a luncheon, where they were told about the consolidation plans. Of the 80 affected employees, some will be moved elsewhere within the firm, either locally or to another affiliate.

"No one will be affected before June 1991, and [any layoffs will happen] by December 1991," Watson said.

First Interstate has also taken pains to ensure that the impact from the conversions on customers and user departments is minimal. Committees have been set up to involve end users in the conversion and future upgrade processes.

Watson conceded that users may not be able to do things in quite the same way as they did with a local data center. "It's clear that the process [of working with IS] will need to be more structured, but we are confident we will not see a reduction of service or responsiveness."

about 95% of IBM's list price, Worrall said.

HDS will continue to sell the EX Model 33, a uniprocessor, and Model 44, a dyadic process-

The new EX models are scheduled for shipment to customers in January; upgrades from installed EX models will be available in second-quarter 1991. Prices range from \$15,000 for an EX 11 with 32M bytes of storage and eight channels to \$2.6 million for an EX 44 with 512M bytes of storage and 32M channels.

# Hitachi 'tunes' low-end EX models

BY JEAN S. BOZMAN  
CW STAFF

SANTA CLARA, Calif. — Hitachi Data Systems Corp. repositioned its low-end EX mainframes last week to more closely correspond to IBM's Enterprise/9000 air-cooled mainframes, which were announced Sept. 5.

HDS changed the computer cycle times to "tune" the existing low-end EX Models 10 through 36, creating a new set of six machines, including four uniprocessors and two dyadic processors. Cycle times on the EX machines were reduced from 20 to 17 nsec, HDS sources said. "Our enhancements happen to result in a better alignment to IBM's airframe machines," said

# The Problem With Buying Software From A Hardware Company

*Once a company gets locked into hardware and software from one computer vendor, it operates at the mercy of that vendor.*

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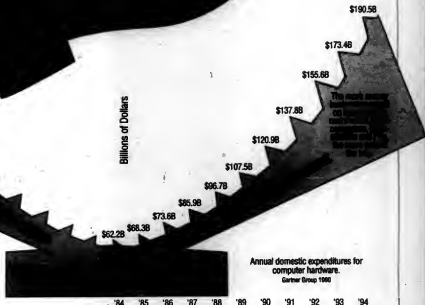
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## NEWS SHORTS

### Software sales boom

The Software Publishers Association (SPA) took time out from its international piracy watch last week to spread tidings of comfort and joy: A 34.4% surge in third-quarter 1990 North American retail software sales logged in at an estimated \$1.15 billion. Data submitted by 150 U.S.-based software companies showed sales of Microsoft Corp. Windows-based applications up 213%; Apple Computer, Inc. Macintosh-based publishing software increased 91%; and MS-DOS/Windows graphics software sales increased 85%, higher than sales posted in last year's corresponding quarter, according to the SPA.

### Aetna reorganization takes shape

Aetna Life and Casualty Co.'s Oct. 26 announcement of a major corporate reorganization will result in the elimination of about 2,600 jobs, according to the company. John Hawkins, a spokesman at the insurance firm, said there were some areas of redundancy in the information systems area and that "it's honest to say that there will be some positions in DP affected," although he was unable to give specific numbers. "It's clear that the majority of them will be job terminations as opposed to attrition," Hawkins said. He added that most of the cutbacks will be at the firm's three Hartford, Conn., area locations, which is where most of Aetna's IS capabilities lie.

### Northern Telecom upgrade in place

Southern Bell Telephone & Telegraph Co. last week became the first regional operating company to install Northern Telecom, Inc.'s Enhanced Network, a central office switch add-on that is said to provide an inexpensive upgrade path for carriers with burgeoning customer bandwidth demands. The product, which Southern Bell has installed at its Atlanta-based central office, enables a previously installed Northern DMS digital switch to support as many as 128,000 simultaneous 64K bit/sec. connections, while reducing the network engineering, provisioning and managing costs typically associated with such an upgrade, Northern said. Later versions will also support fiber-based broadband services.

### IBM forms partnership

IBM last week announced a deal with Check Consultants, Inc., a subsidiary of First Tennessee National Corp., to form a partnership to sell image application software and services to the financial services industry. The joint venture, which is subject to regulatory approval, will be called Check Solutions Co.

### DEC recasts banking packages

Digital Equipment Corp. repackaged its software and services products for banks in the consumer market as an integrated family last week. Called Dechack, the family encompasses existing DEC hardware and communications products and adds a layer of integration software and a customizable user interface. The integration layer allows banks to plug in their existing applications and bank-specific devices.

### Boxing gloves at FDDI meeting?

Though the Fiber Distributed Data Interface (FDDI) local-area network standard was approved and forwarded by the American National Standards Institute FDDI committee last spring, committee members will reportedly duke out a network management tweak to the standard at next week's meeting in San Jose, Calif. Parameter Management Frames are currently an optional component to the Station Management portion of the standard. One segment of the vendor community advocates that the frames be mandatory to ensure network management of all stations in a heterogeneous FDDI network at the lower two layers of the Open Systems Interconnect (OSI) model. Opponents to the mandate, including DEC, generally advocate parameter management functions taking place at the upper layers of the OSI stack, both for security reasons and because of redundancy in FDDI implementations already handling network management.

More news shorts on page 39

## Moccia succumbs to heart attack

BY CARL MALAMUD  
SPECIAL TO ENR

Mary Jo Moccia, senior vice president of the Midwest Stock Exchange and an internationally renowned pioneer in automating financial systems, died of a heart attack on Nov. 16 at age 55.

A versatile executive with wide-ranging interests, Moccia had received much of the credit for the recent performance of the Midwest Stock Exchange, with volume second only to the combined American/New York Stock Exchange.

Moccia was able to convince senior management of the exchange of the benefits of automation. She built a team of pro-

grammers and led the implementation of the system.

Moccia then turned her attention to the automation of stock exchanges throughout the world, including the stock exchanges in Amsterdam and Thailand, where she was visiting in connection with the automation of a trading system at the time of her death.

In a recent interview, she said she viewed stock exchange automation as vital if exchanges were to survive in an increasingly global marketplace.

Moccia's ability to work with senior management and a highly technical staff made her a remarkable person.

"Mary Jo Moccia was the architect and the driving force behind our automated systems,"

said Charles Deberry, president of the Midwest Stock Exchange. "She demanded excellence, was extremely talented, yet was always willing to give credit to the people that worked with her."

Malamud is a freelance writer in San Francisco.



Moccia was financial systems pioneer

## Bush vetoes export bill but seeks loosened restrictions

BY GARY H. ANTIES  
OF ENR

WASHINGTON, D.C. — After vetoing a bill that would have eased restrictions on the export of advanced computers and telecommunications equipment, President Bush ordered federal agencies to streamline and relax regulations governing the export of such items to U.S. allies.

The president vetoed the bill, which would have reauthorized an export law that had expired Sept. 30, on Nov. 16. He said provisions mandating sanctions against countries using chemical and biological weapons would "severely constrain presidential authority in carrying out foreign policy."

Instead, Bush issued an executive order that mandates tighter controls on exports that might be used to produce these weapons and sanctions against countries that do so.

"The president actually listened to some of our concerns and addressed some of our top priorities," said Debra Waggoner, a trade specialist at the American Electronics Association, referring to a Bush memorandum outlining administration plans to ease computer export controls.

The vetoed bill would have required the government to automatically update the performance-level thresholds for export of computers. The cutoff for the strictest controls would have been set at not lower than 25% of the processing speed of the fastest two commercially available systems.

It also would have provided for largely license-free exports to the 16 Coordinating Committee for Multilateral Export Controls (Cocomb) countries.

The Bush memo that accompanied the veto directed the government to do the following:

- Remove many items having both commercial and military uses from licensing requirements for export to Cocomb countries. It is a step toward the Cocomb "license-free zone" urged by industry.
- Shorten the times required to get various export licenses.
- By June 1, in consultation with industry, devise a way to index supercomputers export license restrictions to allow for rapidly changing technology.
- Ensure that supercomputer controls are multilateral so that domestic suppliers are not at a competitive disadvantage.
- Increase the performance thresholds and update them more often for items that qualify for low-level, mass-distribution licenses.

Anne Urban, director of international policy issues at the Computer and Business Equipment Manufacturers' Association (CBEMA), said she was disappointed the president had vetoed the legislation, which CBEMA had backed. "But we're a little surprised the president is doing something. The legislation caught his attention."

## DEC's Phoenix shutdown spells layoffs

BY SALLY CUSACK  
OF ENR

MAYNARD, Mass. — In what may evolve into the company's first official layoff ever, Digital Equipment Corp. announced last week that it will close a plant in Phoenix that employed 460 people.

"We haven't ruled out the possibility of additional plant shutdowns, nor have we ruled out the possibility of layoffs in the future," said Jeffrey Gibson, a spokesman for DEC. He added that only the Phoenix facility itself will be shut down and that all employees at the plant are still officially on the DEC payroll.

This may be a year of firsts for DEC. The company posted its first-ever quarterly losses earlier this year and, according to analysts, must consider across-the-board downsizing to ensure a return to black ink in the future. DEC President Kenneth H. Olsen has stated repeatedly in the past that the computer company hopes to avoid layoffs.

"Clearly, if one looks at the total head count at DEC vs. the total volume they do, some adjustments have to be made," said John W. Adams, chairman at Adams, Harkness & Hall, a Boston-based financial consulting firm. "DEC will either have to raise the bridge or lower the water."

According to David Wu, financial analyst at S.G. Warburg & Co. in New York, the company has a structural cost problem that a "little Band-aid won't cure."

He added that traditional engineering companies such as DEC tend to react slower to this type of cost-cutting change. The Phoenix plant provided multiple services for the company, including manufacturing, systems integration, property disposal and distribution.

DEC has not announced a timetable for closing the facility so far. The company currently employs 123,500 people worldwide.

## Closing Arguments

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## Cadre to boost CASE suite

BY ROSEMARY HAMILTON  
CW STAFF

PROVIDENCE, R.I. — Cadre Technologies, Inc. plans to roll out an expanded set of computer-aided software engineering (CASE) tools for the technical market today.

Teamwork/4.0 will include a reverse-engineering tool for the C programming language as well as an additional design tool for the Ada programming language. The company also expanded its object-oriented analysis support for the C++ language.

The company plans to begin shipping a version designed for Hewlett-Packard Co. Domain workstations in first-quarter 1991. It will follow in the second quarter with versions for other Unix platforms, including Sun Microsystems, Inc., Digital Equipment Corp. Ultrix and IBM AIX, according to Yvonne Cemel, director of product marketing.

The Cadre CASE tool set, first released in 1986, is targeted at technical users running Unix platforms and is typically used for C and Ada development.

Last year, the company released a front-end analysis tool for object-oriented

programming (OOP) that focuses on C++ . It does not yet provide a full suite of tools for OOP. With Teamwork/4.0, the analysis tool will include new features such as proper syntax search capabilities.

### Software redesign tool

The reverse-engineering tool for C, called Teamwork/C Rev, will allow users to build structure charts automatically from C source files, which can be used in redesigning the software.

Teamwork/DSE is a design-sensitive editor for Ada that allows users to keep code consistent with the design representation of a program. The editor enforces the design principles on the code, which helps eliminate errors that can occur when design concepts are translated into

actual code.

Cadre will offer both the reverse-engineering tool and Ada design-sensitive editor as separate add-on components to Teamwork. The additional OOP analysis tool features will be rolled into the base price of the tool set, which starts at \$7,500 per seat.

Pricing for Teamwork/C Rev starts at \$8,000 per seat, and Teamwork/DSE can be licensed for fees starting at \$2,775.

## Consolidation in PC stores

BY RICHARD PASTORE  
CW STAFF

Compucom Systems, Inc.'s offer to buy The Computer Factory, Inc. earlier this month is one high-profile example of a coming deal consolidation that threatens even giants such as Businessland, Inc.

"I definitely think there's a consolidation here," said Charles Wolf, an analyst at First Boston Corp. in New York.

Plunging profits, an overstated dealer market and even slower personal computer sales next year will perpetuate a shakeout and consolidation in 1991, analysts predicted.

For users, a shakeout would lead to fewer choices but may not necessarily mean an end to cutthroat pricing, analysts said. "As long as there are two dealers in a town, there's going to be price wars," one Computerland, Inc. dealer said.

The latest example of consolidation has PC distributor Compucom offering \$39 million for Computer Factory's 63 retail outlets. The offer, which awaits stockholder and regulatory approval in January, seems to have displaced another bidder Bay Street Group. This San Francisco banking concern had earlier offered \$34 million for the chain.

Computer Factory has been hurting ever since it set up an expensive corporate outbound sales force and pushed its territory beyond its Northeast base, observers said. The firm is expected to lose \$13 million this year.

Businessland has also been losing millions, posting four consecutive quarterly losses. In announcing the latest \$19.9 million shortfall, Chief Executive Officer Dave Norman said no offers have been made to buy the company.

"We have a shareholder-rights program in place and a strong relationship with our vendors," Norman said. "I don't think it would make much sense to come in" with a hostile takeover attempt.

Observers were not so sure. Though Businessland's corporate structure would have to be downsized and reshaped to be profitable in today's market, its name recognition could be a valuable asset, analysts said.

The Computer Factory purchase makes more immediate sense, according to Wolf. "Geographically, this looks like a good fit for Compucom," he said. Computer Factory has already begun changing its selling profile to that of a mass-merchandising "superstore," something Compucom will likely continue, Wolf added.

"As a commodity item, the PC lends itself toward a mass-merchandising type of approach," Wolf said.

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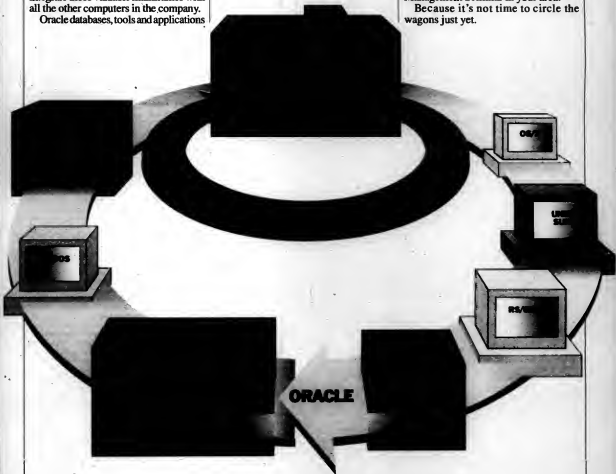
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# User confident Timeplex will stand tall

BY JOANNE M. WELLES  
OF STAFF

PADUCAH, Ky. — A 25-year Unisys Corp. customer is confident that Timeplex, Inc. can stand on its own two feet as its primary communications vendor — despite Wall Street's speculation that the financially ailing Unisys might sell its Woodcliff Lake, N.J.-based subsidiary.

Computer Services, Inc. (CSI), an independent data processing company serving 170 customers, has just brought up a \$300,000 T1 backbone network comprising Timeplex Link/2+ System and Microlink System T1 multiplexers. The network, which integrates time and data, spans among six data centers strung through six Midwestern and

Southern states.

CSI stores and manages data for customer banks, which are on-line with Unisys hosts in the CSI data centers 24 hours per day. CSI's decision to install Timeplex equipment one year ago was made independently of the Unisys/Timeplex relationship, according to R. Lee Hagen, CSI's vice president of telecommunications.

While he conceded that the vendors' relationship was in a nebulous stage at that time, Hagen said Unisys' subsequent financial woes are not posing any new concerns for him about Timeplex.

"Timeplex is a strong company in its own right, and its strength is based on its association with Unisys," he commented. He added, though, that

having Unisys engineering support on-site has turned out to be "icing on the cake."

What CSI considers icing might seem more like butter to other existing Unisys customers who are considering Timeplex equipment, particularly if something were to happen to the Unisys/Timeplex umbrella.

"If I were already a Unisys customer and was investing in the Unisys/Timeplex package, I'd be worried about synergy problems with service and support," commented Rick Villars, commercial

computer networking architect at International Data Corp.,

a market research firm in Framingham, Mass. "If I were not an existing customer, though, I'd simply judge Timeplex's financial stability on its own merits."

The impetus behind the new CSI network is to accommodate burgeoning growth in electronic activity in client banks and to reduce long-distance voice charges "by about 75%," according to Hagen.

Hagen said he expects a payback on his T1 equipment investment in about 3½ years. The savings will come "primarily in trunk charges and new

equipment installations at the banks," he explained.

Hagen said that a major factor prompting CSI to revisit its networking strategy was that

the number of terminals in its client banks "has been growing by about 30% per year over the last several years."

Previously, data chugged over low-speed analog channels both from the banks to CSI's data centers and between the centers. Voice traffic traveled over tie lines between the Paducah and Elizabethtown, Ky., data centers and over dial-up lines between the other centers. Voice is now placed on the T1 network via an interface in Timeplex's equipment that links to CSI's AT&T System 75 private branch exchange.

"At this point, we're not envisioning a need for T3 [45M bit/sec.] speeds, but Timeplex is always on the forefront of interfacing with those new services if we need them. In fact, the company has a number of tie lines in the forms behind the technologies," Hagen said.

## Internet

FROM PAGE 1

started out. A commercialized network must face issues of fiscal accountability, access rights, type of use and whether it should be regulated as a monopoly, noted a "request for proposals" issued on the network this month by a working group of the Internet Activities Board.

Some said a commercialized Internet will grow in scope to rival the voice telephone network, providing all sorts of commercial services, including entertainment — perhaps replacing cable television — transaction processing and information services.

A commercialized Internet could become a national information infrastructure, "a ubiquitous, orderly communications system that reflects and addresses all social needs and market demand without being subject to artificial limitation on purpose or access," said Brian Kahin, director of the Information Infrastructure Project in the Science, Technology and Public Policy Program at Harvard University in Cambridge, Mass.

What will make commercialization possible is the looming threat by the government of network control and direct funding to the private sector.

### Federal support

While federal funding has been a small fraction of the total cost of building and maintaining Internet, the government's control has been considerable since the federal agencies that manage the Internet backbones have traditionally barred most commercial traffic (see story this page).

Internet was built on networks sponsored in the early 1980s by government agencies such as the U.S. Department of Defense and the NSF for use by a

relatively small number of people involved in government-sponsored research.

However, use has skyrocketed with the availability of personal computers and the sophistication and interoperability of communications gear.

A proposal sponsoring the National Science Foundation's NSFnet, which consists of a 1.5M bit/sec. fiber-optic backbone, the so-called "gigabit net" that is likely to replace much of what is now Internet, stipulates that direct federal support for the network is to be phased out whenever commercial networks are able to adequately support U.S. researchers.

NREN legislation failed to win congressional approval this

year but will be reintroduced next year.

Commercial entities such as Performance Systems International, Inc. in Reston, Va., are not concerned that the government will no longer be directly subsidizing the network.

Institutions or companies will buy services from commercial providers, said Marty Schoffstall, vice president and chief technical officer at Performance Systems. It will be up to the service providers to tie into a national network.

Complicating the transition is the fact that there is no formal body to sort out the theory legal and policy issues that are cropping up as Internet grows and

takes on commercial dimensions, according to Lance J. Hoffman, a professor of computer science at George Washington University.

Hoffman said nontechnical people such as lawyers and policy experts should be involved in setting Internet policy. "The essence is, in this research network, is it a research network or a replacement for the telephone system? These are not technical issues, and we shouldn't be asking the technical folks."

An Internet policy currently limits its use to activities not used for research and education. However, in a commercial environment, network users and managers will see many existing

restrictions dropped, leaving the network open to a myriad of transmitted junk and e-mail of nontelephone and e-mail of network and host resources.

Some, such as Scott Coleby, systems administrator at Rockwell International in Newport Beach, Calif., complained about "policy" against vendors. "But if you consider that mail won't become an unbearable problem."

"To some extent, I'm protected because the sender has to pay," said Dave Clark, senior research scientist at MIT's Laboratory for Computer Science. "But if you consider that mail won't become an unbearable problem." He added that those who use the Internet would likely be adept at finding electronic ways to foil abuses.

## Casting a wide-reaching Internet

**I**nternet is a loosely coupled network of networks — approximately 5,000 of them in 35 countries serving more than 3 million users.

The largest component of Internet is the National Science Foundation's NSFnet, which consists of a 1.5M bit/sec. fiber-optic backbone — now being upgraded to 45M bit/sec. — linking about two dozen regional networks. The regional networks in turn connect hundreds of local-area networks at campuses and government, contract to the NSF backbone as well as to their own subnetworks. The regional networks in turn connect hundreds of local-area networks at campuses and government, contract to the NSF backbone as well as to their own subnetworks.

Three other major Internet backbones, sponsored by the Departments of Defense and Energy and the National Aeronautics and Space Administration, connect to the NSF backbone as well as to their own subnetworks. The regional networks in turn connect hundreds of local-area networks at campuses and government, contract to the NSF backbone as well as to their own subnetworks.

The NSFnet backbone is funded by the NSF, the state of Michigan, IBM and MCI Communications Corp. and is managed by Michigan, Inc., a consortium of Michigan universities. The regional networks are partly funded by NSF and partly by its member institutions. The campus-

based networks are generally paid for by their respective institutions, although many of their users are doing research funded by NSF and other federal agencies.

Internet has electronic mail gateways into several commercial services such as MCI Mail, Sprintnet and Compuserve. Reston, Va.-based Performance Systems International operates one of the regional components of NSFnet and sells network services that connect to Internet.

Late in 1990, the NSF's cooperative agreement with MCI expired. At that point, the NSF could renew the agreement or adopt some other funding mechanism. In any case, the NSF is likely to eventually end direct funding of the network and instead support it through its research grants to universities or network users who would pay fees to commercial managers of the network.

Meanwhile, work and funding for the NREN is picking up steam. A bill sponsored by Sen. Albert Gore Jr. (D-Tenn.) failed to clear Congress this year but will be reintroduced next year. However, several agencies are moving ahead anyway to build up the existing NSFnet and to do research for NREN, a nationwide, fiber-optic successor to NSFnet operating at speeds above 1G bit/sec.

J.A. SAVAGE and GARY ANTHEIS

### Citizens' arrests

Currently, users can go up on abuses in a form of citizens' arrests in which users are asked to stop disrespectful behavior, said Vinton Cerf, chairman of the Internet Activities Board. "Quite honestly, it's remarkably effective." He said no abuses have been forced off the network.

Other questions include whether the network should be run on a nonprofit basis or for profit and whether, as a commercial venture, it should be regulated like a utility.

The NREN funding proposal simply directs that the network have accounting mechanisms to support user charges. It also directs an interagency committee to investigate and report to Congress on issues relating to how commercial information providers should access the network and pay for that access.

A Senate staffer who worked on the bill said Congress would play a limited, negative role in sorting out commercial issues but had tried to anticipate some of them.



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## Unix PC

FROM PAGE 1

simplicity, where once there was only hair-pulling frustration, is making Unix more popular. "Unix has drawn a lot more attention because it's become so much easier to use," said Fred Schwedner, director of engineering at Adobe Systems, Inc.,

a former bastion of Apple applications. Schwedner said Adobe is readying a version of its illustration graphics program for Unix because "we've got to play both sides of the fence."

Developers also said they see Unix as the great leveler for users who must juggle operating environments with disparate systems. "It's essential that we provide a package that works on

many platforms, not just one or two," said Chris Williams, director of marketing at Fox Software, Inc. in Perryburg, Ohio. Fox is working with SCO to produce a Unix version of its Foxpro database application next year, Williams said.

Networking software provider and Apple stalwart Farallon Computing, Inc. is readying a combination router and termi-

nal-emulation package that allows Macintosh systems to hook up to and quickly integrate into Unix environments, according to Farallon President Reese Jones. The package will be ready by the second quarter of next year, he said.

Economics is a major factor in the shift to Unix. As the U.S. PC industry begins to slow down, many developers hope to take up

the slack by focusing on Europe, where Unix is already very big.

"Europe has firmly embraced Unix, and that's one market we're targeting very deliberately," said Ron Zamboni, senior vice president of research and development at Cognos, Inc. in Burlington, Mass. "Unix still has a long way to go before it offers all the benefits of some proprietary systems, but if the people want it, we'll give it to them."

Cognos is working on a version of its Powerhouse fourth-generation language for delivery on Unix in 1991.

Other developers said that as PCs and workstations continue on their price/performance collision path, there will be a tremendous crossover of PC users to workstations. "PC users will want to break through to the

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more powerful environment Unix offers, but they won't want to leave behind their PC applications," said Aruel Voyer, executive vice president in charge of operations at Ventura Software, Inc. in San Diego, Calif. Ventura plans to make a Unix version of its Publisher application available in stores by the second half of next year, Voyer said.

The road to Unix, however, is not without bumps. Although it was designed to promote unity, Unix has sometimes caused more strife than stability. The so-called "standard" system is anything but uniform.

"Unix continues to remain the Baskin Robbins of the computer industry: 26 flavors and counting," said Donald McGovern, director of Unix Desktop Technology at Unix System Laboratories, Inc. in Summit, N.J.

Curiously, some developers said the friction has only heightened interest in Unix. "I think the standards battles have brought it up to the eyes of the business user like never before," said Lisa Landa, a spokeswoman at Lotus Development Corp. in Cambridge, Mass. Landa said Lotus will continue to push its Unix applications; Lotus Chairman Jim Mani even addressed the Unix Expo last month.

Groups such as the Open Software Foundation are trying to smooth the differences, but the many implementations highlight the fact that the promise of portability is not yet fully realized; the selection of one of these variants can lock the user into a particular hardware platform.

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Consortiums striving to define single benchmark standard for the computer industry

BY SALLY CUSACK  
CW STAFF

Analysts last month's Corp. a top-of-the-line, eight-way multiprocessor at 350 million instructions per second (MIPS). Hitachi Data Systems Corp.'s megamainframe is rated at 150 MIPS. But while some third-party vendors talk in IBM MIPS, Digital Equipment Corp. speaks in VAX units of performance (VUP), and others have their own rating schemes, leaving users to decipher which machine

suits best for their needs.

There is no single definition of a MIPS rating, but until flexible benchmarking programs become a reality, it appears that information systems directors at major U.S. corporations will be forced to use the outdated MIPS method as part of their purchasing decisions.

"People are very confused about this whole area," said Kim Stanley, who is serving on two consortiums established to create standard benchmarks within the industry. Spec caters to the stand-alone, technical workstation environment, while the Transaction Processing Performance Council (TPC) targets the commercial transaction-processing market.

According to Svend Hartmann, president of Computer Merchants, Inc. in Hawthorne, N.Y., a MIPS rating is a "crude measure," but it is valuable in its simplicity. "It serves as a rough kind of comparison," Hartmann noted, "but it does provide an easy way of comparing the relative power of IBM mainframes."

"It's an important part of the mainframe decision," said Michael W. Byrnes, vice president of MIS at Harcourt Brace Jovanovich, Inc. "MIPS plus memory plus operating system plus application software — they all come together to form the entire picture."

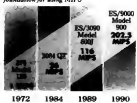
James Vaselek, vice president of data processing at Kay Jewelers, Inc. in Alexandria, Va., concurred that MIPS is "an important part of the overall algorithm." However, he added, MIPS speed in itself becomes less important in a distributed processing environment because of the varied stresses put on the system.

IBM itself does not use MIPS ratings in the traditional sense. The firm has developed the Internal Throughput Rating (ITR). Dick Schardt, IBM's manager of processor performance evaluation at its Washington, D.C., systems center, said the ITR method is simple.

"We take the number of transactions, divide that by CPU utilization, and the result is the ITR," Schardt said. He added that 10 or 15 years ago, the single-number MIPS ratings were an accurate means of measuring CPU performance. However, he said, in the world of real-time transactions, single-number measurements

## Starting point

By today's standards, the IBM 370 Model 158 was anything but hefty, but it did provide the foundation for using MIPS



CW Chart: Phil Welch

are no longer valid.

Over the years, hardware vendors have developed MIPS in various forms.

DEC developed its own version of the MIPS rating: the VUP, based on the median of a benchmark's results that DEC attained on the VAX-11/780 system, and the VAX MIPS, obtained by running the Dhrystone benchmark and dividing it by 1.757 — the number that is attributed to

the VAX-11/780.

Users of Unibus Corp. machines have their own particular ratings to consider when making a purchase decision: the Relative Performance Measurement (RPM). According to a spokesman, the RPM illustrates the relationship between older Unibus machines and newer models. The RPMs are based on benchmarks developed internally by Unibus engineers.

Blake Wilkinson, manager of data processing at Amalgamated Sugar Co. in Ogden, Utah, is converting from a Unibus B series machine to the A series mainframe. He admitted to using a "cheat sheet" card that compares the Unibus RPMs with IBM machines assigned a MIPS rating, but he said while the card is a good guide, it by no means provides a final answer.

Vendors and users agreed there must be a common work load established: "one that everyone has agreed upon and that no one will tinker with," Stanley said. To that end, the TPC, with 36 members including DEC, Hewlett-Packard Co., Control Data Corp., Sun Microsystems, Inc., Unibus and Oracle Systems Corp., has developed specifications written for two approved benchmarks.

Looking ahead, Stanley conceded that it is going to be a long haul. "We have to look at these groups as ongoing, permanent institutions," he said. "We will never have one benchmark that will represent every dimension of computing."

## Definitively speaking...

Below are several general definitions of commonly used benchmarks:

- **Linpack:** Written in Fortran, this benchmark was designed to solve a dense system of linear equations and has become a de facto industry standard measurement of floating-point performance.

- **Whetstone:** Originated in 1970, this is a synthetic benchmark (meaning it does not solve any real-world problems). Performance is related to hardware features and performance, the system's math library and the efficiency of the code generated by the compiler.

- **Dhrystone:** A synthetic benchmark originally developed to approximate program development and office automation applications.

- **Transaction processing:** A disk-intensive test representing commercial applications that measures performance in a multiuser setting of 20 users.

- **Graphpointe (graphics):** Based on 122 tests that measure drawing rates for a variety of graphics elements.

- **Knemstone:** Developed to represent computer performance in a mix of scientific and commercial applications. The results are based on 22 tests measuring CPU, disk I/O and floating-point performance.

SALLY CUSACK

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## Version Merger eases strain of upgrading IBM software

BY JOHANNA AMBROSIO  
CW STAFF

What do you get when you cross off-the-shelf mainframe software that has been customized with a new version of the same software? Chaos, generally, which is what a new tool aims to reduce.

Version Merger, announced last week by Skillman, N.J.-based Princeton Softtech, Inc., was designed to help information systems shops reconcile different versions of IBM mainframe software.

Many large IS departments buy packaged software and change it to meet their unique requirements. Problems arise

when a new version of a software package is delivered, because it is often difficult to figure out how to change the upgraded version to reflect previous customization.

That is where Version Merger comes in. It can reduce, by 30% to 50%, the time required to fit site customizations to a vendor's new release, according to Joseph Allegra, president of Princeton Softtech.

The tool compares three versions of the software — the original, the one with the user organization's changes and the new release. An "intelligent merge editor" identifies conflicts and differences, makes the changes requested and helps test the results.

Karen Piza, an application support analyst at Warner-Lambert Co. in Morris Plains, N.J., used Version Merger in a feasibility study on upgrading AMAPS, a manufacturing package from Dun & Bradstreet Software. AMAPS contains over 5,000 modules, and Version Merger helped Piza's team determine that they would have to modify about 1,000 modules in order to do the upgrade.

"The time required just to assess the impact of a new release can be days or even weeks. Version Merger shortened the impact analysis to minutes," Piza explained.

Version Merger runs under IBM MVS and is available now for \$17,500.

Princeton Softtech, a private company founded 14 months ago by former executives of Applied Data Research, Inc., sells two products and has approximately 35 customers, Allegra said. The firm "is profitable," he added.



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## ADVANCED TECHNOLOGY

## TECH TALK

## Very VGA

■ Deficon International in Placentia, Calif., has introduced a Video Graphics Array (VGA) board that the company claimed delivers high-resolution graphics comparable with those of the IBM 8514/A and adapters based on the Texas Instruments, Inc. TIGA interface specification at one-third the cost. The new CAD Resolution and Color Enhanced board generates two to three times the number of pixels that can be displayed by conventional 1,024- by 768-pixel VGA graphics boards, producing flicker-free color images of near photographic quality, the company said. The board is priced at \$495.

## A shaky sea floor

■ For the next eight years, a SeaFloor Earthquake Measurement System (SEMS) developed by scientists at Sandia National Laboratories will monitor undersea seismic disturbances 10 miles off the coast of Southern California. The SEMS is 50 times more sensitive than earlier versions, and it is expected to detect an average of five earthquakes in the region per year, with Richter scale magnitudes of 3.0 and greater, project leader Gerard Slesse said. SEMS consists of a sea-floor electronic package that records seismic data and transfers it to a shipboard receiver using underwater acoustic telemetry.

## Clean machine

■ Researchers at Sandia National Laboratories are developing robots capable of mapping and removing radioactive waste from leaking underground storage tanks. A robot equipped with ultrasound, active computer vision, ground-penetrating radar and metal detectors makes three-dimensional maps of the surface and subsurface contents of a storage tank. The robot can also be equipped with a variety of attachments to break up hardened waste deposits, cut solids into pieces small enough to be carried by a grabber and suck up materials.

## Is the cure worse than the disease?

Scientists mull over wisdom of siccing good viruses and worms on their bad brethren

BY MICHAEL ALEXANDER  
OF IBM

If there are "bad" viruses and worms, why not "good" viruses and worms? Imagine a program that is designed to seek out malicious code and destroy it, perhaps riding a computer of the problem even before the user is aware of it.

About two years ago, computer scientists at Hebrew University in Jerusalem devised such a "good" virus, which sought out and erased a malicious virus that would have deleted files if left to run unhindered. Some antiviral products already on the market are able to hunt down and kill viruses, but they may not do a good enough job, according to some experts. "Antiviral software is a disservice to computer security, because it is not securing the device," said Thomas Sobczak, vice president of Application Configured Computers in Baldwin, N.Y., a security consulting firm and antivirus software publisher. Sobczak said that it may be impossible to protect against a virus. "It's like in weapon development—for every weapon, somebody can make a better weapon."

## The hunter-killer question

Application Configured Computers, as well as university researchers and other virus experts, are mulling over the wisdom of developing "hunter-killer" viruses and worms that would roam in search of pieces of code that do not behave in predictable ways or alter executable files without authorization. "We developed a Unix-based worm called a 'tandem cooperative processor,'" Sobczak said. "The program looked for anomalies, and if it saw an anomaly, it would derail the processing stack so it did not get executed."

Whether such programs will actually ever be used is questionable. Even

though they are well intentioned, they could end up doing more harm than good. Computer programs are seldom error-free, for one thing. When a virus is replicating, it attaches itself to other programs, thus changing them. A hunter-killer virus would have to change the programs again to revert

data after the personal computer has been rebooted a preset number of times.

"The question is how to do it in a way that if the program doesn't work like expected, it won't mess up everything else," said Lance Hoffman, a professor of computer science at George



M.E. Colton

them to their original forms. A minor programming glitch could result in a hunter-killer virus that would eat not only the virus but also the good code.

Some experts worry that a good virus or worm could be modified and sent out to do damage. The Den Zuk, or Search, virus was originally created to seek out and eradicate the Pakistani Brain virus, written by a computer programmer who owned a small software store in Lahore, Pakistan. The original Den Zuk will remove the Pakistani virus, but subsequent versions will format a hard disk drive and completely wipe out programs and

Washington University in Washington, D.C. "No one should study has been done on that. Would I, if I were given the opportunity to, say, write a network worm to do good things? I probably wouldn't because of the liability issues involved."

Even good viruses would interfere with computer systems, spread without users' consent and modify executables. There is simply too much risk involved, said David Stang, director of research at the National Computer Security Association in Washington, D.C. "Virus researchers are unanimously opposed to the concept," he said.

## Bellcore steps toward holographic memory

BY MICHAEL ALEXANDER  
OF IBM

A team of researchers at Bellcore recently demonstrated a technique for quickly retrieving single-page video images from a crystal—a step toward developing computers with holographic memory.

The scientists said that the technology could be used in low-cost multimedia computers that could store at least 10 times more information and retrieve it at speeds approximately 1,000 times faster than today's computers. "With expanded capacity, multimedia computers could become as popular as the VCR," said Bang-Gi Paek, a Bellcore researcher. Paek said

the research team plans to build a prototype that could be used to retrieve full-motion video images.

## Small size, big capacity

Bellcore's three-person research team used an array of ultrasonic lasers and photorefractive crystals about the size of sugar cubes whose optical properties can be altered by light. A crystal measuring one cubic centimeter could store up to one million holographic images, according to Bellcore.

The researchers recovered the equivalent of an 8½-by 11-in. page of text from a prototype crystal storage system in less than 1 sec, or one-billionth of a second. They estimated that a computer system with holographic memory could store more than 1G

byte of data.

The technique involves taking light from a microslit only 40 microns of an inch wide and dividing it into two separate beams. Information in the form of an optical image is then carried along one of these beams, while the second beam serves as a reference beam for the first. Light-regulating modulators, powered by electric current, combine the two beams in the crystal to create three-dimensional holographic images. The images resemble light and dark lines spread in microscopically thin bands.

The stored information, now a holographically recorded memory, is retrieved when illuminated by the original reference beam, comprised of an array of micron-size lasers.

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# U.S. tech heading for dead end

WILLIAM C. NORRIS



The U.S. high-tech industry is headed toward second-rate status in global competition.

If such a disaster is to be avoided, we must manage technology better. At the same time, there must be a substantial increase in funding by the federal government for commercial research and development.

To manage technology better, we must increase technological cooperation at home and abroad. We must utilize available resources more effectively and gain access to foreign technologies. At the same time, more equitable technology flows must be achieved between the U.S. and foreign countries.

Technological cooperation must be expanded in both R&D and manufacturing. In the U.S., we have already seen a considerable increase in cooperation in R&D among larger companies, universities and government agencies (federal and state).

These efforts must be expanded to include more participation by smaller businesses. Since businesses are a major source of innovative products and services. These objectives

Norris is the founder and chairman emeritus of Control Data Corp.

can be achieved only if the federal government provides more money for commercial R&D. This would stimulate the expansion of cooperation and share the cost and risk of getting next-generation high-tech products into the marketplace.

Foreign governments, especially in Japan and Germany, have assumed a significant portion of the cost and risk of coop-



erative programs to develop emerging technologies with broad commercial applications. This support has been a major factor in helping those countries establish dominant positions in a number of high-tech markets.

Foreign research is called for in the U.S. The federal government must provide information, encouragement and part of the funding for technology development programs such as uni-

versity and company consortiums, both large and small. Government laboratories should participate when appropriate. The selection of technology to be developed should remain the primary responsibility of the private sector.

Foreign cooperation should be a critical focus of these efforts. Expanding cooperation in the manufacturing of high-tech products is key because many U.S. high-tech companies are lagging in the use of advanced manufacturing technology. This is especially true for small and medium-size firms that lack affordable access

to such technology. As a result, they are at a serious competitive disadvantage in global markets.

We should establish advanced electronics manufacturing service centers, where companies pay for the services as they are rendered, with no investment required in center facilities.

International technological cooperation must be more broadly based, involving many more organizations. This can be

accomplished through international cooperation whereby a state or a group of states in the U.S. establishes cooperative activities with counterparts in other countries.

An international, inter-regional program should have three major components: formation of small-enterprise joint venture companies; cooperation in establishing advanced manufacturing service centers; and cooperation in applied research.

The underpinning for inter-regional cooperation in applied research is the large number of research centers in many countries. Though they are creating useful results, most do not have funding commensurate with their capabilities and the need

our university research and leading-edge, small-company technology.

The U.S. is not afforded equivalent opportunities in Japan because most of the research in that country is under the control of private companies, and because Japan does not have the same kind of extensive, innovative small-business sector. However, regional efforts are under way there to foster the start-up of high-tech companies.

Considering the support in Japan and Europe for high-tech small-business development and the emergence of high-tech private companies in the Soviet Bloc — and many research centers — there is an unprecedented opportunity for international, interregional technological cooperation. At the same time, equitable technology flows can be achieved.

Implementing such an audacious, comprehensive program on a global scale is not as formidable a task as it might first appear. Every state has organizations and programs for assisting small companies and fostering applied research. Similar activities exist in most other countries. Thus, for the most part, support infrastructure is in place. With U.S. dedication to the program, the U.S. competitive position can be greatly strengthened in world markets.

## Users ready for Unix; is Unix ready for them?

AMY WOHL



Unix conferences are generally cozy affairs. The clan gathers in Unix folk prepare to talk to one another about the arcane issues they adore. Users leave feeling bruised by all the technol-

But at the recent Unix Solutions Conference in Anaheim, Calif., something amazing happened. Almost all of the attendees were at their first Unix conference. Most of them were there to learn something about how to use Unix. They were interested in the benefits of non-portable systems, not the fun of belonging to an exclusive club and meeting for one more opportunity to try out Unix jargon. And they were impatient.

You could hear that as they listened to panels and presentations. Why, they asked, are there so many versions of Unix? How can something be a standard if it's so variable? And if I need to buy a special version of each software package for each hardware platform and operating system version of Unix, then what exactness does portability mean?

In one session, the Open Software Foundation (OSF) and Unix International declined to appear in public over their differing views on open systems (OSF's, a kind of Unix look-alike vs. Unix International's Unix System V Release 4). They insisted there was plenty of room for more than one player at the table. One disgruntled attendee didn't wait for the formal question-and-answer session after the talk. Instead, he stood up and firmly commented, "OSF and Unix International ought to toss a coin and let us know who wins. Then we can just get on with this."

Others at the conference seemed frustrated by the con-

tinuing division and duplication of efforts between the followers of AT&T and Sun Microsystems (members of Unix International) and those of IBM, Hewlett-Packard and DEC (members of the OSF). They are tired of the delays that result from developers having to choose which version of Unix (or open systems) they'll write software for first and which they'll port to later. This can be an important issue, because the chosen development environment may not only get software sooner — it may get software that is better optimized to its particular features.

Users wanted to see more applications. Unix marketers are famous for talking about how much software there is. An examination of offerings, however, brings the cold light of reality. Of course there is some real, commercial-quality software for standard applications such as word processing, electronic mail, database management, accounting and so forth. But Unix is heavily weighted in favor of technical software for the engineering community, which it has long served. And there are lots of specialty products for niche scientific applications.

Fortunately, the lack of commercial-quality software should

be ending soon. Many of the personal computer vendors have decided to move their most popular products (Lotus' 1-2-3, Wordperfect, et al) to the Unix platform. As others follow, more choices will be available. They are joining existing Unix developers and minicomputer and mainframe software publishers who have been moving to the Unix/open systems bandwagon.

### Meeting user needs

There's more to giving users what they need than producing software, however. Commercial users are not only accustomed to a considerable product selection, they also expect convenient acquisition routes and strong support.

Getting the product to these users will be a challenge. Unix software doesn't fit through the shrink-wrap channel yet. Direct sales are expensive and a barrier to entering the marketplace for many vendors, further limiting the amount of available software.

An intermediary seems to be required. Certainly not the retail store model that succeeded for early PCs. Perhaps a value-added reseller or systems integrator model is called for.

Users are sometimes sur-

prised at the level of support that Unix systems can require. It is, of course, possible to entirely mask Unix from the user, and small business offerings have often chosen this course. But in larger firms, where companies need to get at the system to add users or tools or to do programming, this would be inappropriate.

This means we need new mechanisms for Unix and open systems support from individual software vendors as well as overall hardware and systems houses. The latter are usually prepared to provide support, but software firms entering the Unix market from the PC market will initially find the additional support requirements daunting and must prepare either to meet them or have dissatisfied users.

Unix and open systems offer users substantial benefits in portability, interoperability and freedom of future choice, but commercial users who are attracted to these benefits and are now strongly interested in the open systems market will become disenchanted quickly if Unix vendors are not prepared to offer sufficient choice, excellent support. There is still a lot of work to do here to get the market ready for the users.

Wohl is president of Wohl Associates in Bain, Maryland, Inc., and editor of "The Wohl Report on End-User Computing" newsletter.

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Computer Systems News, May 26, 1990

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For instance, now OS/2 1.3 harnesses the power of Adobe Type Manager™ (ATM™).

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PC Week, August 13, 1990

With this new feature, the quality of screen fonts has improved dramatically, giving you a true WYSIWYG capability so what you see is indeed what you get. ATM also gives OS/2 more flexibility in document creation by supporting a wide range of outline fonts.

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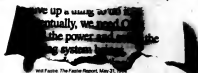


### BUSINESS IS BOOMING.

Now that OS/2 is moving forward, so are software developers. Every day, more and more applications are joining the growing pool of available OS/2 software. In fact, a variety of major business programs, including Aldus® PageMaker®, Lotus® 1-2-3® and Microsoft® Excel, have already made the transition to OS/2.

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Wall Factive, The Factive Report, May 21, 1990

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# SYSTEMS & SOFTWARE

## Bull takes first CASE steps

Plans to make formal product announcements in early 1991

BY SALLY CUSACK  
CW 31477

BILLERICA, Mass. — Bull HN Information Systems, Inc. recently raised the curtain on company plans to enter the computer-aided software engineering (CASE) market, with formal product announcements scheduled for early 1991.

Bull executives, while enthusiastic about the CASE commitment, were tight-lipped about details, indicating only that the software would run on an Intel Corp. 486-based Unix platform and that the entire suite of products would be some specified way cooperate with the IBM Repository concept.

According to Cory Devor, director of U.S. marketing for

Unix and open systems products at Bull, the company will rely on its own development team as well as a variety of third-party vendors.

While analysts reacted with surprise to the announcement, most acknowledged it as a necessary move in today's market.

According to Vaughan Merlyn, chairman of the CASE Repository Corp. in Bellevue, Wash., most key manufacturers, including IBM and Digital Equipment Corp., are viewing CASE as a strategic marketing component.

Merlyn observed that while the new Bull product line would probably not be a significant revenue generator in the "grand scheme of things, it does get a foot into the door of the IS com-

munity," Merlyn cautioned, however, that Bull may be facing a "tough haul" to establish itself in the CASE arena.

"I'm a little surprised; this is a real challenge for them," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass.

### Looking for tools

However, Bull users have been looking for additional tools and software from their vendor for quite some time, according to Shirley Eick, president of the Bull Users Society.

"CASE is a hot button," Eick said, "and the user reaction will be very positive."

Woodring added, "CASE fits into the whole strategy of sys-

tems integration, something Bull is pushing. This makes sense for Bull as long as the products are good — the CASE competition is fierce, and the user community is wising up."

Woodring speculated that while there are more than 100 vendors in the CASE marketplace today, less than 10 are doing any significant volume of business, and he said he feels that Bull may be trying to follow IBM and DEC's lead by trying to establish a "mind share" in the CASE market.

Lou Mazzarelli, chief technical officer at Cadre Technologies, Inc., a major player in the technical CASE arena, said that although he was not surprised at Bull's recent move toward that technology, he questioned its timing. "It's a hard time to get into the MIS CASE market, or any market for that matter," he said. "Differentiation is going to be the key, and the question is, will they have it?"

## Networks get automated storage

BY MARYFRAN JOHNSON  
CW 31477

When Ray Bates talks about his cross-country job of managing network storage for nearly 240 workstations, he calls it "an amusing task."

Yet, the software manager at the University of Southern California's Information Systems Institute is hardly laughing.

Between 200 Sun Microsystems, Inc. workstations at the Los Angeles-based university and 30 to 40 Sun machines back in Washington D.C., at a U.S. Department of Defense installation, Bates wrestles daily with backup and storage needs that cannot keep up with user demands.

"We have a lot of Sun servers, and backup is becoming a nightmare," Bates said. "Our operators have a hell of a time backing up the tapes in a timely manner, and users are screaming about them doing this in the daytime."

So when Epoch Systems, Inc. came along with the first pieces of its Renaissance client/server software for automated storage last month, the Westboro, Mass.-based vendor had a ready customer in Bates.

The most welcome news for users such as Bates was Epoch's extension of its automated network management software beyond its own fairly pricey hardware and onto Sun Sparcstations and Sun 3 machines. Epoch servers range in price from about \$60,000 to \$700,000, providing on-line access to high-capacity disk storage over an Ethernet network.

Epoch's specialty since it began

Continued on page 35

### FEATURE: THE OLTP CRAZE

## OLTP's fiery display isn't all show

BY MARY LOU ROBERTS

The on-line transaction processing market (OLTP) is sizzling. Many companies are into OLTP in a big way. At the same time, vendors are providing OLTP offerings, enhancing existing products and introducing new ones. Why all the fuss?

OLTP is more than a solution in search of a problem, users and consultants say. Users find that moving old batch applications to an on-line environment and developing OLTP solutions increases operational effectiveness.

business, meets the needs of more competitive information organizations and answers end users' demands to act quickly in meeting market pressures.

The fact that OLTP is aligning itself with smaller platforms and open systems may also make it attractive to many users.

"For us, going to OLTP was purely a business motivation," says Rich Chapman, vice president of information systems at health care giant Humana, Inc. in Louisville, Ky. Humana is working on a pilot project to install a Tandem Computers, Inc. OLTP offering for its hospital patient care system. An OLTP will help Humana be more effective in a deregulated market, Chapman says.

Continued on page 34



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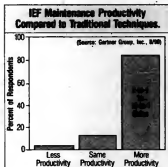
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) IEF developers reported zero defects—not one abend had occurred in IEF-generated code.

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Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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# Gerber's bumpy road to AS/400

IS group spends twice as long as expected migrating from System/36

## ON SITE

BY MICHAEL FITZGERALD  
CHICAGO

FREMONT, Mich. — At Gerber Products Co., the information systems group has traditionally favored mature technologies over those born yesterday. But the last year has seen IS go through the process of bringing up baby — "baby" being an IBM Application System/400 Model B40.

Last year, Gerber installed the AS/400, replacing the IBM System/36 minicomputer that ran the Gerber plant here.

Switching over to the AS/400 hasn't been easy. Gerber has configured its factories in hierarchical fashion, with System/36s sitting between the mainframe host and its personal computers.

Two circa-1981 IBM 3081s are linked together and hooked to a 3725 communications controller — all purchased in the aftermarket. There are roughly 100 terminals and PCs (primarily IBM Personal System/2 Model 55SXs) in each of its four manufacturing facilities. The PCs are directly attached to the minicomputer and can pass through it to the host and sign on as a terminal. The mainframes also serve as host for the company's administrative needs.

Gerber brought in the AS/400 to replace the System/36 because it wanted the AS/400's relational database capabilities and needed the extra

disk space and memory.

Although the company considered the System/38, "I really felt that System/38 technology was too old to deal in the aftermarket," said John Kralek, director of corporate MIS. "Since we're on the front end of the AS/400, it looked like a good investment that we could hold onto for a while."

Kralek is not as happy being a new "infuser" as he thought he would be, though.

"Price/performance is a real issue," he said. "I'm not sure of the throughput I'm getting, and leftover capacity is not as great as I would have expected. There's a lot of room for us to grow, but it's a real expense in comparison to the System/36."

Kralek and his staff have also spent twice as long as expected getting up to speed on the AS/400. The problem has not been in porting applications from the System/36 to the AS/400, which required little more than a weekend, or in converting to native AS/400 code in cases where System/36 emulation mode was not performing well.

Rather, the problem has been learning to program the system while developing a new warehouse inventory locator and management system, written in-house in RPG 400. "It was a bigger learning curve going from System/36 to the AS/400 than I had been led to believe," Kralek said.

"IBM worked hard at supporting us, but I'm not sure that they understood the machine, either.

They seemed to be learning along with us."

Kralek said the new system represents a fundamental change in the way Gerber's warehouse employees are used to working. Where workers once were assigned jobs in somewhat random fashion, their forklifts



Gerber's Kralek helped make the midrange switch

now have terminals that direct them every step of the way.

Yet the application has smoothed out, and Kralek said his staff is developing a new plant management application slated for installation in six months.

This month, Gerber is installing an AS/400 Model B45 in its Fort Smith, Ark., plant, upgrading its Fremont AS/400 to the Model B45. The company will install another Model B45 in its Asheville, N.C., plant before the end of the year.

Gerber has also begun new projects on the AS/400. It licensed Lotus Development Corp.'s 1-2-3/AM on one of its 3081s. Kralek is pleased with the way users have reacted to it and says the software "really

IBM through Metaphor Computer Systems, Inc., an IBM business partner, under OS/2.

The project aims to make external and internal sales data more readily available to the marketing and sales departments. Kralek said he expects the application to be implemented in the middle of 1991.

One thing Kralek does not like to do is charge into new projects without a solid warehouse system, for instance, the company is studying the benefits of the application and what it will take to develop.

"Our management is planning-conscious," Kralek said. "They want you to define what you're going to do — the benefits to be gained from it — and establish milestones that you can measure your progress against."

For instance, Kralek said, Gerber is looking to implement a sales information system in January. The system was designed to allow the company to regularly collect information it has in the past only collected once every six months. Gerber's 530-person sales force will carry portable computers on sales calls and retrieve information, such as product sales, on the spot. At the end of each day, the representatives will feed their information via modem into the mainframes.

"It will allow us to capture a higher quality of data about our products on the shelves, what our competitor has on the shelf, what's changed since the last visit," said Bruce Erickson, Gerber's marketing and administrative systems manager. "It's a higher quality of data about the rep to set up displays, present a new item, that type of thing."

## Software plans shop-floor schedules

Product also feeds information into high-level D&B Software system

BY ELISABETH HORWITT  
CHICAGO

DETROIT — A finite scheduling product announced this month by Dun & Bradstreet Software's Advanced Manufacturing International Division can determine optimal scheduling on a detailed level for the shop floor and can also feed work-center scheduling information into the more long-term, high-level scheduling system provided by D&B's AMAPS manufacturing resource planning (MRP II) software, the company said.

D&B's new AMAPS Finite Scheduling System uses rule-based algorithms to come up with optimal schedules that balance a "complex array of parts and processes across machines" at multiple work centers. D&B spokesman John Lischefski said.

The system calculates schedules on the basis of available ma-

chine and human resources, scrap and other production information it collects through D&B's Factory Control and Management System.

It can also take into account business objectives such as quality, on-time delivery and maximizing capacity, which can be weighted by the user, Lischefski said.

"D&B has identified a hot market segment — factory-floor management — which sits between factory control and [manufacturing resource planning]," said Bruce Richardson, a vice president at Advanced Manufacturing Research, Inc. in Cambridge, Mass.

"That area has been a void, but it is becoming important" — particularly as companies move toward "pull-based manufacturing," where production is driven by customer orders, which "push-based systems," which

are driven by the need to reach a predetermined inventory level, Richardson said.

Traditional MRP systems, which were designed for push-based manufacturing, do not provide the detail, up-to-the-minute scheduling that pull-based

software, Finite Scheduling can come up with "the optimal scheduling solution" for a given set of parameters, Lischefski said.

This is in contrast with other products, which require that users try a succession of "what-if" scenarios for optimizing workloads, he added. "We also provide the capability for the user to move things around as things change, but no user can figure out how to allocate 4,000 to

shop floor is synchronized with master production scheduling for an entire plant or product division.

"With the same scheduling engine, you get the same answer; before, answers [that were] gotten on the shop floor consisted with the high-level answers" generated by MRP, Lischefski said.

While the initial package only supports sequential files, it will be hooked to relational database management systems at an unspecified future date, Lischefski said.

AMAPS Finite Scheduling System is based on a product developed by Manufacturing Software, Inc. in Cambridge, Mass. It will be initially offered on Digital Equipment Corp. VAX/VMS systems.

D&B plans to migrate it to IBM-compatible workstations based on Intel Corp. 80386 and 1486 workstations at an undisclosed date. It is priced between \$100,000 and \$300,000, depending on system configuration, and it will be available next month.

**WITH THE SAME SCHEDULING engine, you get the same answer; before, answers [that were] gotten on the shop floor consisted with the high-level answers" generated by MRP.**

JOHN LISCHESKI  
D&B SOFTWARE

manufacturing requires, Richardson said. "Thus the need for an MRP front end like D&B's finite scheduling product."

Through rule-based algorithms incorporated into the

6,000 open orders across six centers.

The link between finite scheduling and D&B's AMAPS MRP II ensures that short-term, detailed scheduling for the

# OLTP

CONTINUED FROM PAGE 29

"Companies that surpass their competitors in providing better, faster, more responsive information [through OLTP] will gain a first strike advantage," adds Tom Willmott, a principal at the Aberdeen Group in Boston.

This kind of demand for ready access to up-to-the-minute information has helped make OLTP the fastest growing computer market segment, according to Ray Schulte, program director at Stamford, Conn.-based Gartner Group, Inc. Schulte estimates that the OLTP market for hardware and software (not including application software, services or support)

will grow from \$35 billion in 1989 to \$72 billion in 1994.

## What's new?

In some ways, OLTP is nothing new. It is an evolution of mainframe CICS, a proprietary transaction manager first implemented by IBM in the 1960s. With 40,000 installed sites today, CICS remains the most used OLTP monitor in the industry.

OLTP, as defined by many industry analysts, is different from the old time-sharing on-line monitor technology. "OLTP implies the existence of a database that is available for on-line access with update and inquiry for remote users," says Omri Serlin at Item International, a Los Altos, Calif.-based OLTP consulting firm. Serlin

says classic examples of OLTP include the airline reservations systems of the '60s and the on-line banking applications of the '70s and '80s.

OLTP is differentiating itself further from CICS by evolving to smaller platforms and open systems, primarily distributed systems on a Unix platform. In fact, several vendors are betting their lives on the fact that smaller midrange systems will be an increasingly attractive choice for OLTP users in the future.

Digital Equipment Corp., Hewlett-Packard Co., AT&T, Sequent Computer Systems, Inc., Sequoia Systems, Inc., Tandem and Stratus Computer, Inc. all offer midrange OLTP options and will be trying to steal those transactions off of IBM CICS mainframes.

For its part, IBM came out in September with a statement of direction to make CICS available under AIX, its Unix offering. And industry watchers say it is likely that CICS will become available for OS/2 and the Application System/400 platforms. But IBM has yet to announce any dates.

## Going down

Hyatt Corp. in Chicago recently joined the ranks of open and decentralized. It replaced its IBM mainframe that performed OLTP with four Unix-based processors from AT&T to operate its on-line customer reservations system, according to Joan Lowell, vice president of telemarketing and reservations services at Hyatt.

"We made the change to an open sys-

# EIS

## If You're Thinking About It...

## A nicety

System availability has always been a major issue in the operation of on-line systems. For most users, ensured continued operation is a matter of degree.

Tandem Computers and Stratus Computer have carved a market niche out of users who demand round-the-clock availability.

Availability at K Mart Corp. is tied closely to the bottom line, so its Stratus systems must operate without interruption. "We move about 50,000 credit authorizations per day through the system, and it has to be up," says David Carlson, senior vice president of information systems at the Troy, Mich., retail company.

But other users, while they are concerned about availability, do not see the need for adding the cost of full fault tolerance. Michael Prince, director of information services at Burlington Coat Factory Warehouse, notes, "We have the luxury of being able to store and forward some transactions."

Vendors are taking advantage of this shifting scale by offering degrees of what Aberdeen Group's Tom Willmott calls "fault resilience."

New microprocessing and disk mirroring technologies have been unveiled that can provide a high level of system reliability without the price of full fault tolerance, Willmott adds.

Fault tolerance is seen by many users as a nice-to-have but not critical capability, Gartner Group's Ray Schulte says. But in a competitive OLTP market, fault tolerance may be an option that differentiates vendors.

Several of the traditional mainframe vendors are now actively addressing the fault-tolerant requirement.

So, if Gartner Group is correct in its prediction that the fault-tolerant systems market is only \$1 billion and not growing significantly, then Tandem and Stratus are likely to find themselves with some heavy competition in a small but crowded niche.

MARY LOU ROBERTS



terms environment so we can have greater on-line connectivity to our properties and receive more reservations electronically from various distributed sources including airlines and travel agents," she says.

Companies such as Hyatt are responding to what Floyd Hale, general manager of the Software Platforms Division of Blue Bell, Pa.-based Unisys Corp., says are the two forces driving OLTP: "First, worldwide business interests dictate that an 8 a.m.-4:55 p.m. business environment is no longer appropriate. Second, there is great focus on decentralization with a requirement for seamless transaction processing in an open environment."

For its part, Unisys is developing standard OLTP applications based on X/Open Co.'s Distributed Transaction Processing model.

#### Modified Unix

Unix's role as the platform of choice for OLTP is not without its problems, however. Current complaints about Unix's shortcomings include the fact that its file system is not geared to support transaction processing, its networking protocols are not reliable, it can't handle multiple interactive users well, and, above all, it was designed as a general-purpose time-sharing system.

According to Serlin, "Unix is really a poor vehicle for implementing OLTP. It lacks the facilities that are required by any serious database-driven application." He admits, however, that database vendors and terminal handlers have been able to bypass some of Unix's limitations to date.

What Unix does offer is a standard platform, the portability of open systems and, as Serlin notes, "the interchangeability that users want. That's important in an OLTP environment."

Burlington Coat Factory Warehouse is one user that demanded a Unix open systems OLTP platform (AT&T's Tuxedo), says Michael Prince, director of information services at the firm. The company's application, an on-line national distribution system that tracks sales and inventory and manages the flow of data between systems in the network, operates on Sequent computers.

Whatever the weaknesses of Unix, it is clear that it will be a key player in the OLTP drama, judging by the commitment to it by virtually all the OLTP vendors.

"Users are saying, 'That's how we need [Unix/OLTP]. Change the rules.' So the vendors are," says analyst John Rymer at Patricia Seybold's Office Computing Group in Boston.

Rolbert is a free-lance writer and consultant in Glenoldie, Pa.

## Not easily defined

While the definition of on-line transaction processing is debatable, most analysts agree on a few key characteristics:

- Access, inquiry and update of a database that changes business-critical data in real time.
- Diverse, often remote users.
- Fast response times.
- High transaction volumes.
- High levels of system availability, if not fault tolerance.

## Networks

CONTINUED FROM PAGE 29

gan shipping its storage servers two years ago is a technology that combines optical and magnetic storage and backup, giving users the illusion of endless disk space. The automated software moves little-used files and data out to magnetic disks, but users can recall the information in less than 15 seconds.

The same software that Epoch has been using on its own platform is now being sold as Renaissance Infinite Storage, ranging in price from \$1,500 to \$15,000. The Infinite Backup software is scheduled to be available in the first quarter of 1991. The debut of the Renaissance products

signals the storage hardware vendor's first move toward becoming a storage software company. The intent is eventually to run its network management software on any computer platform on the network, company officials said.

Along with the Sun agreement, Epoch announced alliances with Mips Computer Systems, Inc. and Hewlett-Packard Co. to move the client portion of its client/server software onto their platforms in 1991.

"Two years ago, the only real way for us to bring storage management to a heterogeneous environment was to build the platform ourselves," said Ken Holberger, chairman and vice president of business development at Epoch.

Bates noted, "Management of network storage is pretty haphazard, and

managing it centrally would solve a lot of problems for us."

An Epoch-1 server in Washington, D.C., is now "the single point of failure for our whole system," Bates said, explaining that all of the university researchers using the Sun network store both active and inactive files on the Epoch machine. While it has never crashed, he added, "I try to be very conservative. If that machine breaks, they can't get to their data."

Holberger said Epoch's server and storage management software is now positioned as an archive-level repository of storage, providing services through the Network File System protocol.

"With Renaissance, we'll be providing that capability directly to the end users of the service," Holberger said.

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\*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

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## PRODUCT REVIEW

## Oracle fields a solid player

## Oracle Systems Corp.

This is the sixth in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for

exclusive publication in *Computersworld*.

Each product is observed in action over a three-day period during which a vendor team solves the case study project coding system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at Oracle Systems

Corp.'s Oracle development tool set, which is based on the SQL language.

Carried out by Oracle in Bracknell, England, its team of three people provided

a comprehensive and attractive solution to the benchmark and fully earned the rating of "excellent" for the level of completion.

Held back slightly by a Personal System/2 environment that struggled with the application, the team still completed the benchmark and its enhancement in 16 hours and 30 minutes. The overall effort of 40 hours and 45 minutes was one of the best so far. Thus, we rated speed of development "very good."

The most telling element of the benchmark came at the end when the team had to enhance its solution. They could have gained the top mark but lost time by an unfortunate implementation decision. Still, the speed of maintenance was "very good."

The Documentation also had to be rated "very good." The

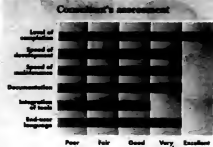
CASE tool presented clear entity diagrams and program descriptions. The detailed documentation at the lower levels was well structured and readable. The differences between design and implementation were highlighted, however, they had to be addressed manually.

With a number of different tools, integration is important and requires considerable support. On the positive side, most of the implemented system was directly generated from the CASE environment. However, any low-level changes were not automatically reflected back in the design. At the high level, business rules were entered but were taken as comments only. Finally, two data dictionaries were used for design and production. Under the circumstances, they bordered on "good."

The end-user language SQL\*QMX was very powerful and produced excellent results without much effort. While simple file displays were easily handled by the untrained end user, more sophisticated presentations required an understanding of relational logic. Nevertheless, the end-user language had to be

rated "very good."

When looking at the marks of this assessment, Oracle's results are consistently very good, lacking any significant weak spots. For the first time in the series, the benchmark was completed well before the end of the third day. While it is a very flexible solution that can be ported to many environments, attention has to be given to avoid being lost in unnecessary complexities.



## Development and maintenance report card

**ANALYSIS AND DESIGN:** CASE foundations were set for the database structure and program architecture. Running on OS/2, the Case/Designer is unidirectional but can pinpoint differences between designed and implemented data structures. **Strengths:** It generates data structure and program logic. **Weakness:** Business analysis is not integrated.

## DATABASE SETUP: S

This stage was fully automated. However, the database initially generated contained only the basic data structure with most editing rules left to be implemented at the program level. **Strengths:** Automatic and very fast. **Weakness:** A secondary data dictionary had to be generated.

## FILE MAINTENANCE

**TRANSACTIONS: B** Very efficient, screen user interface with an automatic inquiry facility on every field. Single-file logic required little effort. Yet much time was needed when multiple files had to be maintained by a single transaction. **Strengths:** File has powerful screen printing.

**Weakness:** The going gets harder in multiple file logic.

## COMPLEX

## TRANSACTIONS: A

Despite the elaborate screen layout, most of this transaction could be automatically generated, which contributed to the fast implementation time. The presentation was nicely laid out but numeric data had to be entered left justified.

**Strengths:** Generated transactions can be easily refined.

**Weakness:** No support for

time data handling.

## INQUIRIES: A

The 'query-by-example' style tool was very efficient. The task was completed in good time and very well presented. Providing access to the data dictionary, the programmer simply selected the necessary fields to answer the two inquiries. **Strengths:** It is very fast.

**Weakness:** Presentation is somewhat rigid.

## COMPLEX REPORTS: B

## Staging the benchmark



Although the results were obtained quickly, the implementation required tedious detail work when defining the report layout. Some minor rounding errors occurred because of substandard time handling.

**Strengths:** It is a flexible reporting tool. **Weakness:** It has no report painter.

## INTERFACE: B

The Ashton-Tate Corp. Dbase file was converted into an Oracle database using the DBSPREP function of SQL\*Loader. This part of the interface was accomplished, but the batch editing process that followed took longer than expected to develop.

**Strength:** It is an integrated conversion tool.

**Weakness:** Batch processing is not as well automated as online transactions.

## ENHANCEMENT: B

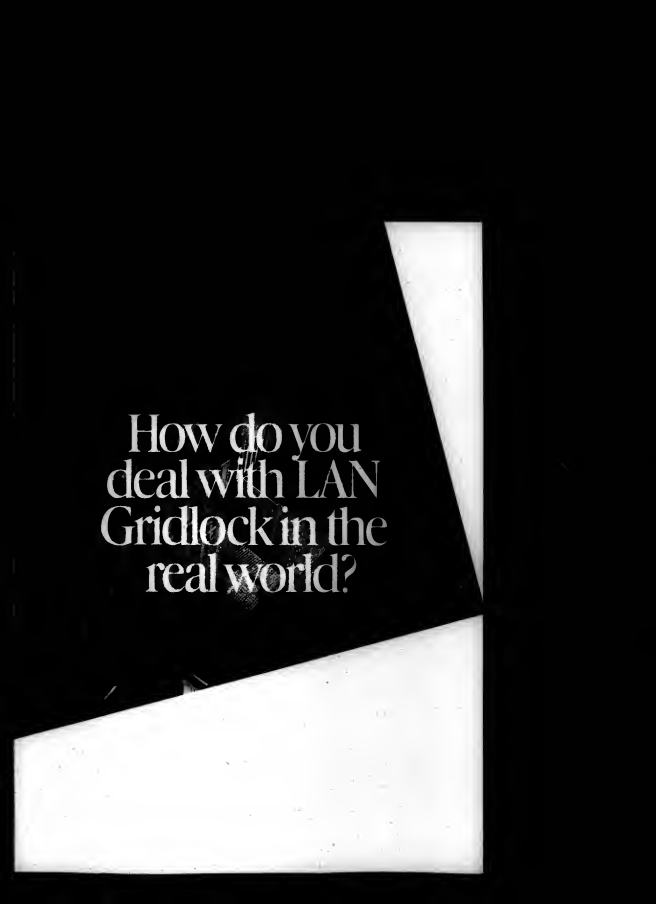
The selected enhancement required changes in the data structure, screen layout and all reports. These were handled fast with the exception of the complex report, which required considerable debugging. The design documentation was not updated. **Strengths:** It is an environment that supports maintenance effectively.

**Weakness:** It is not automatically reflected in the design documentation.

The solution was initially developed on a PS/2 IBM Token-Ring network with three stations dedicated to the development team. The completed Oracle solution was then transferred and tested on an IBM 4381 mainframe under MVS/XA.

Details of the product can be obtained from Oracle World Headquarters, 500 Oracle Pkwy., Redwood Shores, Calif. 94065, (415) 506-7000.

Development World product briefings are based on a series of full sessions in the case study. They are prepared by leading vendors and published along with in-depth product analyses and consultants' test reports in *Development World Libraries*. Please use business reply card between pages 76 and 77 or fax (508) 820-01-66 for a brochure.



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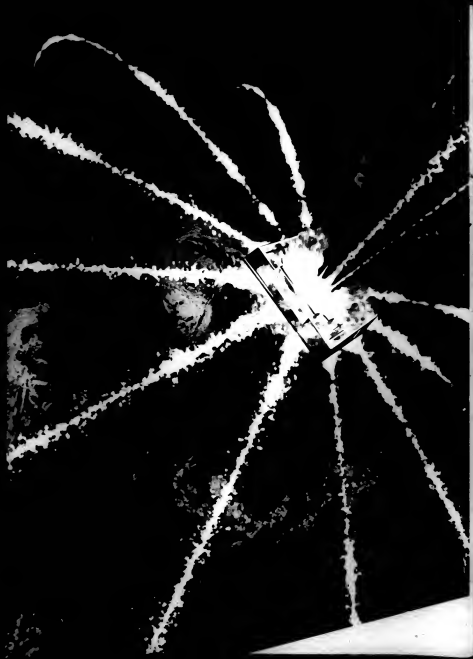
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# PCs & WORKSTATIONS

## COMMENTARY

Richard Pastore

## Upgradable imprint



When IBM introduced its high-end Personal System/2 late last month, it put the ultimate endorsement on the concept of personal computer CPU upgradability. By joining the first proponents of this technology, IBM has served notice to the industry that this is truly the way to go for high-end PCs.

The ability to swap processors in Intel-based PCs was first promoted by so-called second-tier vendors in the mid-1980s. AST Research, Advanced Logic Research and some others have offered 80286-based boxes that users could boost to an 80386 or even an i486.

Many analysts thought of these upgradable designs merely as mildly interesting gimmicks. Vendors who didn't offer it ridiculed the concept as technologically inefficient.

Users have been able to cool to upgradable boxes. One reason has been that businesses preferred to hand down old 286 machines to neophyte users and buy powerful units for their hotshots. Others opted to buy more powerful PCs than necessary and "grow" into them.

But the tightening economy and the approaching saturation

Continued on page 44

## A plethora of high-end server choices

### ANALYSIS

BY RICHARD PASTORE  
CWI STAFF

The recent rash of rollouts in the high-end personal computer server arena may have many users reeling over the diverse assortment of brands, designs and capabilities. More than ever, trying to sort one from another means understanding your network's needs and matching them to the server's capabilities, observers said.

Applications and the number of users are the first considerations for most shops planning a purchase.

"If you're talking about a small work group with a high degree of emphasis on electronic mail, you'll want something configured as a communications server," said Tom Willmott, vice president at Boston consulting firm Aberdeen Group.

For file and communications servers, lower-end Intel Corp. 80386- or 80386SX-based systems are generally adequate, analysts said. Many users agreed, saying they are content with these low-end configurations.

"Last year, we considered a [reduced instruction set computing] machine, but we didn't think

we needed that much horsepower," said John Carroll, vice president of MIS at Cumberland Farms, Inc. IBM 386-based Personal System/2 Model 80s "have done a fine job for us to this point," he said.

On the other hand, if the network must serve multiple departments, then 32-bit I/O machines with upgradable processors should be considered, said Frank Daubeck, president of Communications Network Architects in Washington, D.C. The same recommendation holds for servers that must perform compound functions — act as a gateway to outside services as well as a file or database server, Daubeck noted.

Once they have established a need for high-end servers, users come face to face with a barrage of platform choices. "During the last 12 months, you've had a filling out of the marketplace," Daubeck said.

Many vendors are jostling for sales potential. Demand for high-end PC servers will increase by 40% per year through 1993, said Workgroup Technologies, Inc. in Hampton, N.H.

When sorting out this crowd of vendors and machines, users say their key considerations are I/O, systems flexibility, technical support, brand name and price.

## But which server?

PC servers span a broad power range and determining which is appropriate depends on the number of users and desired application



\*Based on Company system design.  
Source: Customer, Computer Corp.

CW Chart: December 30, 1991

Accounting firm Deloitte Touche, happy for now with 386-based servers, is studying IBM's new 1486-based PS/2 for future possibilities. For the large data sets moving across Deloitte's networks, throughput is the key to platform choice.

"We're looking to get data to and from the file server by the fastest possible means," said Claude Rankin, MIS manager at the New York office.

### Flexibility key

Other users say flexibility is the key to their buying decisions. Mike Purcell, manager of technical planning at Baxter Healthcare Corp., said he chose a Compaq Computer, Inc. Systempro because of the ability to add users "fairly smoothly without running into a wall."

"I needed a system where I could always grow," said Louis Arena, systems officer at Citibank NA in Plainville, N.Y.

Arena acquired a dedicated PC server from Netframe Sys-

tems, Inc. to replace 286-based machines. "A regular 386 or 486 server wouldn't have given us that advantage," he said. Many users view such upgradability as investment protection — a prime consideration with system prices starting at \$15,000 and running up to \$70,000 or more.

Can Cable, Inc. in San Diego recently added a second 420M-byte hard disk to its Systempro. "I didn't lose any of my existing investment," systems analyst Mark Olsen said.

The enormity of the hardware investment and the critical nature of the server pushes brand-name reliability above price on many users' criteria lists.

"Our experience with Compaq and IBM have shown they have viable, attractive products," said Michael Ball, data processing coordinator at the Federal Reserve Bank in Baltimore. "We know we could save money by looking elsewhere, but we don't feel the need to."



Deloitte  
Touche's Rankin

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# A laptop sinks to new depths

Researchers dive with Compaq device to watch stingrays' mating rituals

## ON SITE

BY PATRICIA KEEFE  
CHITNEY

In the shallows of the Gulf of California last spring, neurobiologist and researcher Timothy Tricas spent 10 days diving with a waterproofed laptop used to track part of the ordinarily secretive stingray's mating ritual.

Tricas, who is a research associate at Washington University's School of Medicine in St. Louis, and Scott Michael, a student at the University of Nebraska, wanted to test whether the bioelectric field produced by stingrays is sufficient to attract potential mates. "Would male stingrays dig up the females using electrostimulation to find mates?" Tricas asked.

While British Broadcasting Corp. and National Geographic cameras roamed, Tricas and Michael put a customized Compaq Computer Corp. SLT 286

through its paces in a remote bay off the coast of Sonora, Mexico.

Shielded in a fortress of Plexiglas and weighted down with 40 pounds of ballast, the laptop was used underwater to play back digitized waveforms through electrodes buried in the sand. (Females attempting to avoid mating-minded males often bury themselves on the ocean bottom.)

The waveforms were collected and digitized from stingrays back at the lab and then synthesized for playback. Tricas used the laptop to adjust waveform frequency and amplitude.

The experiment's success resulted in male stingrays serging on or near buried electrodes from many feet away, displaying the first phase of courtship. Some were so fooled that they attempted to dig up nonreceptive females, drawing slaps for their trouble.

The project has resulted in the first look at the sensory neuro-

biology of an electroreceptive system as it relates to the biology of a natural population of elasmobranchs.

Tricas spent three to four months building his system from the ground up with donated equipment. "I looked at every laptop that exists, but only one—Compaq's—could accommo-



Compaq's SLT 286 collected bioelectric field data from stingrays

date 16-bit external data acquisition and digital-to-analog cards in a portable mode," he said.

He selected the 14-pound SLT 286 because it was fast, held an internal coprocessor and offered access to the motherboard bus. "This is important [in order] to bring these peripheral boards in contact with the system. Most laptops have proprietary buses," he said.

Tricas wrote the application driving the project in the DOS-based Asyet high-level language, in part because it supported the data acquisition and playback cards he purchased from Metrabyte in Taunton, Mass. Keithley Instruments, Inc. also supplied Tricas with the electronic equipment he needed to make preliminary measurements of stingrays' electrical fields.

"Asyet allows you to get hands-on with the data acquisition to manipulate files for analysis and output," Tricas said. "We had superb technical support."

This project would have been impossible without conversations with Compaq's engineers and

isolation amplifiers from Analog Devices, Inc.). Tricas said, explaining that he had to go into the bowels of the computer and insert a specialized attachment to support the full-size cards. Some vendors will not allow users to root around inside their hardware. Apple Computer, Inc., for example, used to seal its Macintoshes.

"[Compaq's engineers] had concerns, but they were totally supportive," he said.

Tricas compared the housing wrapped around the laptop to that used to protect underwater cameras. A chunk was cut out of the Plexiglas to make room for a membrane that protects the keyboard yet still ensures typability.

"You can do anything at 100 feet that you can do in an office, but obviously a lot slower," Tricas said.

The internal battery was supplemented with a 10-A, 12-V external battery pack attached to the laptop via an underwater cable.

How well did the system perform? "I'm the first man to play Pac-Man underwater at 30 feet," Tricas quipped.

## COMDEX NOTEBOOK

Depressed because you missed Microsoft Corp.'s keynote Bill Gates' keynote at Comdex? Well, fret not! Microsoft is already a step ahead of you, assuming you've got 10 bucks to spare and four to six weeks to wait. Last week, Microsoft ran a large ad with headline-size type offering a choice of a free white paper on Bill's speech, "Information at Your Fingertips," or, for a measly \$10, a 45-minute VHS video of Gates' flashy (and mega-expensive) presentation. How thoughtful. We have one quibble, however: In tiny type, the ad says, "Offer good only in the 50 United States." We thought there was only one United States, but perhaps cloning has reached new heights.

Anymatrix Corp. unwrapped a version of its Toolkit for OS/2. Toolkit is used to build graphical applications without traditional programming languages. The OS/2 development environment is much more complex. Users

are developing more sophisticated applications, and there aren't many off-the-shelf packages," President Paul Allen said. By empowering users to develop their own applications more easily, Toolkit allows them to become productive under OS/2 much faster, he claimed.

The recently formed Multituser DOS Federation unveiled its viewpoint on standards, which focused on application programming interfaces that control record-locking, access to files and communications ports, internetwork communications and operating systems identification. The aim is to identify existing standards that simplify the interconnection and use of multituser DOS components. The 20-member group also distributed "Understanding Multituser DOS."

Over at the Wordperfect Corp. booth, attendees received both cowboy

hats and the news that Wordperfect for Windows and a major upgrade to Wordperfect for the Macintosh will ship in the first quarter. On a less urgent note, the company also announced that Wordperfect for Next is slated to ship before the end of this year.

Comdex/Fall '90 was reportedly the largest trade show ever in the U.S. More than 120,000 crammed into the five-day show. The total acreage of the show floor was as great as 40 football fields. There were more than 22 miles of aisles. If all the copies of the show programs were piled atop one another, they would rise 1 1/4 miles high. More than 1,800 reporters from around the world covered the event.

You know things are getting slow when a vendor puts out a press release hyping the fact that its edge over the competition is a hologram of its computer on the show guide cover—not the computer itself. Evans Corp. is so taken with the hologram of its latest computer (sorry, no model number was in-

cluded in the release) that the company plans to incorporate the hologram into "commemorative" key chains, buttons and paperweights. "We have been a slow day in corporate P.R."

At least one vendor tried to bring the Green Revolution to Comdex. Magee Enterprises, Inc., which "likes to consider ourselves the company with an environmental conscience," sent out party invites packed with little green facts. For example, "In the time it takes to read this invitation, more than 20,000 trees will fall in the world's rain forests. Within the next minute alone, another 50 acres will be destroyed. Forever. Think about it." Invitations were invited to kick in ideas on improving the environment. Meanwhile, Magee ticked off its contributions: paper, glass, plastic and aluminum recycling; the elimination of plastic trays; swapping Tyvek sleeves to paper; and, in some cases, eliminating outer packaging altogether.

Compiled by Patricia Keefe, James Daly and Michael Fitzgerald.

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## Older technology: Good to last drop

BY JAMES DALY  
OF ENSEMBLE

Populist heroes seem as rare as hen's teeth these days, and the computer industry is no exception. Customers frequently complain that many company leaders seem willing to provide only the latest and greatest widgets for leading-edge users and never go to bat for those trying to squeeze the last drop of functionality out of older technologies.

That may soon be changing. If the reception be received at a Comdex/Fall '90 panel discussion exploring the battle over graphical standards is any indication, Geoworks Chief Executive Officer Brian Dougherty could soon lay claim to the position of the personal computer industry's voice of the common man—or at least the voice of anyone who has a shop full of older PCs and workstations.

Dougherty's Berkeley, Calif.-based firm is in the final stages of putting out Ensemble, a graphical user interface that requires only a fraction of the system resources of Microsoft Corp.'s Windows 3.0 operating environment, runs on IBM Personal Computer XT-class systems and offers the Open Software Foundation's Motif user interface. While Ensemble still has a way to go before a full suite of applications is available, if it is all it's cracked up to be, it could emerge as the savior of millions of DOS users who crave the point-and-click simplicity of Windows but feel cut out by the environment's voracious system requirements.

Early Windows 3.0 users complained that it must be used with at least an Intel Corp. 80386-based PC and about 4M bytes of random-access memory, or it's a waste of time.

### Bums on anything

Ensemble is designed to run on anything from the now-ancient IBM PCs and XT's to leading-edge i486-based workstations. Ensemble requires only 512K bytes of RAM, a hard disk, a mouse and a graphics display, and it will run on 8086- or 8088-based systems. It will be priced at \$200 and is scheduled to ship early next month.

Geoworks trimmed the system requirements through efficient coding techniques, said Vice President of Marketing Lee Levano. The firm also employed programmers who crafted Ensemble in assembly language, which requires less RAM and disk capacity, Levano said.

Microsoft officials, meanwhile, have maintained that Windows was specifically designed to be a next-generation product, and they have warned users to stay abreast of new developments or be prepared to suffer the consequences.

Some analysts said this logic is flawed. "Corporate buyers can't be happy that Windows won't run on any of the PCs they've purchased over the past five years," said Jeff Tarter, editor and publisher of "Softletter," an industry newsletter.

With the economy slowing

down, Dougherty said, it is also increasingly unlikely that users will have the spare cash for expensive upgrades. "You don't want to give every clerk in your office a 386-based PC with 6M bytes of memory," he said. "But you do want to give them a graphical environment that

makes their job easier."

Is Ensemble too good to be true? In some ways, yes. Like Tandy Corp.'s Deskmate user interface, developers must write specifically for Ensemble to take advantage of its features.

Meanwhile, users must satisfy themselves with the applications that are bundled with Ensemble. These include a word processing program, a file man-

ager and some rudimentary communications and drawing programs. There is no spreadsheet program available yet.

However, analysts said, when and if those deficiencies are eradicated, Ensemble could become a serious player. "This isn't just a beauty contest," Tarter added. "Ensemble has long-term potential in the graphical environment."

# There Of Good Reasons These Are

ProAudit

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ProUtility



## Autodesk heeds end users' suggestions

BY CAROL HILDEBRAND  
OF STAFF

When Autodesk, Inc. started to work on the latest upgrade to Autocad, its popular computer-aided design (CAD) software package, the company did something many firms only pay lip ser-

vise to: It listened to its users.

"They're changing, which is great," said Vijay Parikh, a systems engineer at Compaq Computer Corp. in Houston. "They didn't listen to their users [before], and now they do, and that's a big improvement."

Autocad, which dominates

the market with an installed base of 400,000, has several important enhancements in Release 11. Users in particular cited Paper Space, enhanced network support, reference files and text editors, as well as the speed achievable with the new release.

"We expect Release 11 to be

the most significant upgrade since Autocad was first introduced," said Malcolm Davies, an Autodesk senior vice president.

Bob Calloni, CAD manager at Hornberger & Worstell, Inc., an architectural firm in San Francisco and a Release 11 beta-test user, agreed. "It is [the most significant upgrade], more because of its speed than anything else. It's more like a blink of the eye as

opposed to watching that hard drive blink."

Parikh was particularly impressed with the new networking support available in Release 11, which he said will save on the time necessary to upgrade Compaq's 350 users and lost data.

"Until now, it was the end user's responsibility to back up all the drawings," he said. "Now it's tension-free, because it becomes the network administrator's responsibility, and whatever he does, he's always 100% sure that the drawings will be backed up every night."

The text editor was another feature that flowed from user discontent. "We've been asking for a text editor for years," Calloni said. "Now I can get rid of some of the [third-party software] on my hard drive," he added, "and start using the ones that should have been part of the program from Day 1."

**T**HEY DIDN'T listen to their users [before], and now they do."

VIJAY PARIKH  
COMPAQ

Other features cited by users included reference files and a function called Paper Space. According to a beta-test user in a manufacturing company who asked not to be named, Autocad previously allowed only plotting, or printing of hard copies, of one view of a component at a time. With Paper Space, "you can put more than one view on one hard copy," the user said. Paper Space also allows a user to resize and reconfigure the different views, as well as plot them with a single command.

Parikh was also impressed by the annotation abilities available in Paper Space. "If you have a 3-D model, you don't want to write anything on top of your model in your design file. But when you actually plot it, you want to annotate that or put some text on it. That can be done now through Paper Space," he said, adding that it was also useful for adding comments on drawings, which is rather like writing in the margins of a manuscript.

Parikh also praised the reference file function. He compared it with overlaying a drawing done on transparent paper onto the design in progress. So, for example, "you can reference a plumbing drawing and then make the electrical layout without having the plumbing objects in your drawing," he said.

Autocad Release 11 is priced at \$3,500, according to the vendor. Release 10 users can upgrade for \$500, and upgrade costs for Release 10 for 386 users is \$200.

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## Pastore

FROM PAGE 37

point for desktop PCs at many companies should make upgradeable PCs more attractive. This is particularly true at the high end, where server-type boxes are starting at \$10,000 to \$20,000.

Probably picking up on these changes, the big-name vendors have finally followed the upgrade trail blazed by the second-tier vendors. In mid-1990, NCR and Compaq introduced PCs specifically marketed as upgradeable.

And now IBM's PS/2 Model 90 and 95 come to market designed with the ability to swap 25-MHz 486 chips for a 33-MHz 486. That's a narrow upgrade grid, but coming from IBM, it is still significant for the industry.

Some of the early criticism of low-end IBM-compatible upgrade machines seems to be valid. What's the point of sticking a 486 chip in a 286-style

chassis? An AT-style bus and slow disk drives just can't do justice to the top-of-the-line processor.

But at the high end, buses, drives and other components will serve a 386 or 486 virtually as well as they served a 20-MHz 386SX CPU.

High-end PC shoppers are beginning to base their brand selection on a large extent on upgradability. For example, most Compaq Systempro owners you talk to will say upgradability was the chief reason they bought the machine and is the thing they like best about it. The ability to boost the processor from a 33-MHz 386 to a 33-MHz 486 is more immediately valuable than the option to add a second CPU, many say.

However, users inclined to switch up say PC with an upgrade option should remember that these vendors aren't offering upgradability just to be nice. One of the benefits for the vendors is that upgrade boards are proprietary. You have to buy IBM's upgrade from IBM and

pay whatever price IBM charges. The same is true for the other makers.

Therefore, users would be wise to shop around. Prices for upgrade boards vary widely from vendor to vendor, depending on how many component chips and controllers are included with the CPU on the upgrade board.

Vendors also benefit from upgradability because when users run out of juice on an upgradeable box, they are likely to stay with the same vendor rather than shop the competition. It's sort of repeat-customer insurance for the manufacturer.

Users, in turn, must size up their vendor as if they are entertaining a long-term relationship, because that's what it's likely to be.

And now that IBM has added its Midas touch of legitimacy to the concept, there will be more upgradeable-PC vendors than ever to choose from.

Pastore is a Computerworld senior writer.

## Grid unwraps I486-based network server

BY SALLY CUSACK  
CHICAGO

FREMONT, Calif. — Grid Systems Corp., a Tandy Corp. subsidiary, made its first foray into the network server market recently with the announcement of an Intel Corp. I486-based system standard around the Extended Industry Standard Architecture (EISA) bus.

Christened the Grid 486E1-25/ASVR Tower, the 25-MHz server system was demonstrated for the first time at Comdex/Fall '90 in Las Vegas earlier this month.

According to Grid, which made its reputation in the portable computer sector, the server includes nine expansion slots designed to offer users up to 4G bytes of hard disk storage capacity.

The system comes with a standard configuration that includes 8M bytes of random-access memory, which is expandable to 64M bytes, and the availability of seven 32-bit EISA expansion card slots.

### System extras

An extended IBM Video Graphics Array-compatible adapter, one parallel and two serial ports and a 1.44M-byte 3½-in. floppy disk drive are also included with the system.

Users have the option to choose from a variety of peripherals, such as tape drives, hard disks, compact disc/read-only memory or write-once read-many optical disc drives, the company said.

Slated for delivery in December, the product is priced from \$11,999.

### Products

10865 Rancho Bernardo Road,  
San Diego, Calif. 92127  
(619) 485-8411

Nisael Sanyo America Ltd.'s 14-in. multiaccess monitor was designed for business graphics applications.

The 14MXX low magnetic field monitor includes ergonomic features such as a silica-based antistatic screen, a tilt/swivel base and front-panel controls. The monitor also provides IBM Video Graphics Array compatibility to 1,204-by-768-point resolution and compatibility with Apple Computer, Inc. Macintosh II machines.

The product is priced at \$395.

Nisael Sanyo America  
800 South St.,  
Waltham, Mass. 02154  
(617) 893-5700

### Data storage

Microdot Technology, Inc.'s MicroDAT MD-3330 Backup System was designed for IBM Personal Computer XT, ATs or compatibles, Apple Computer, Inc. Macintoshes and Sun Microsystems, Inc. workstations.

MicroDAT MD-3330 is based on the West Laboratories, Inc. Wapnet 3.3G-byte tape drive. The product includes a 16-bit smart computer system interface host adapter for use with PC systems and features an access time of 20 seconds, the vendor said.

Price starts at \$4,295.  
Microdot Technology  
20 Mason  
Irvine, Calif. 92718  
(714) 837-6033

## NEW AT COMDEX/FALL '90

The following is a second listing of some of the products and technologies announced at the Comdex/Fall '90 show in Las Vegas.

### Software applications packages

Penncomp Software Development has announced a literary quote retrieval software package available for Micro 3 ft. Windows environments.

Quotemaster Plus for Windows enables users to access more than 3,000 literary quotes on-screen.

The product uses between 2.9M and 3.9M bytes of hard disk storage and requires an IBM Personal Computer or compatible. It costs \$89; additional quote bases are \$25 each.

Penncomp Software  
4660 Beechmont  
Houston, Texas 77096  
(713) 669-0965

Version 3.1 of Inner Media, Inc.'s Collage Plus image management and screen-capture program for MS-DOS environments includes a functional screen capture program for Microsoft Corp.'s Windows 3.0.

The product costs \$129.

Inner Media  
60 Plain Road  
Hollis, N.H. 03049  
(603) 465-3216

Manzanita Software Systems' inventory control module is now being included with its Business Systems Integrated Accounting System.

Features of the module in-

clude purchase ordering, ready pricing information, flexible product tracking, multiple costing methods, general ledger updating and tracking of back orders.

The product runs on IBM Personal Computer XTs, ATs, Personal Systems/2s or compatible and is priced at \$295.

Manzanita Software Systems  
2130 Professional Drive  
Riverside, Calif. 95661  
(916) 781-3880

Orcad Systems Corp.'s ESP Framework is a graphical user interface that has been integrated with the company's Release IV range of DOS-based design automation tools.

Electronic designers can use the product to perform tasks that were previously noninteractive or time-consuming, the vendor said.

ESP Framework includes an enhanced version of the company's schematic design tool set and is priced at \$695.

Orcad Systems  
3175 N.W. Alcock Drive  
Hillsboro, Ore. 97124  
(503) 690-9881

Textware Corp. unveiled a version of its Textware text indexing and retrieval package that was designed for Apple Computer, Inc. Macintoshes.

Textware for the Macintosh is compatible with Version 3.0 of Textware for MS-DOS and local-area network platforms. It enables text and image databases to be created, indexed and used for retrieval on any of the three platforms, the vendor said.

Single-user pricing is \$495; for an unlimited number of users on a LAN file server, the price is \$2,995.

Textware  
P.O. Box 3267  
Park City, Utah 84060  
(801) 645-9600

Royle, Inc.'s Instant Orcharding is an organizational charting program designed to enable users to manage information graphically.

Instant Orcharding enables users in government or corporate environments to create and immediately update changes pertaining to employees, owners, shareholders or military personnel.

Users can choose an unlimited number of chart styles, fonts, colors and patterns, according to the vendor.

The product is available on 3½- and 5¼-in. disks. It supports Microsoft Corp.'s Windows 3.0 and is priced at \$149.

Royle  
2215 Filbert St.  
San Francisco, Calif. 94123  
(415) 563-9175

### Peripherals

Unizys Corp. demonstrated three dot matrix printers designed for workstation environments.

The AP9210 (\$2,395) operates at 10 pages/min. and features emulations for Hewlett-Packard Co.'s LaserJet II, IBM Proprietary XL and HP Graphics Language Plotter.

The 80-column AP1337 and 136-column AP1339 are both 24-pin devices that feature eight resident fonts and provide emulations for the Epson America,

Inc. LQ-2550 and IBM Proprinter X24E/XL24E machines.

List prices for the AP1337 and AP1339 are \$699 and \$949, respectively.

Unizys  
2700 N. First St.  
San Jose, Calif. 95150  
(408) 434-2848

Facit, Inc.'s Facit P8100 is a 10 megapixel printer that is compatible with Hewlett-Packard Co.'s LaserJet II and Adobe Systems, Inc. Postscript machines.

The product enables users to design fonts, forms, logos, signatures and other graphic or text elements according to their specifications, the vendor said.

The P8100 is available in four configurations. Pricing begins at \$2,399.

Facit  
400 Commercial St.  
Manchester, N.H. 03108  
(603) 647-2700

Personal Computer Products, Inc. has an enhanced version of its Imagescript cartridge for Hewlett-Packard Co. LaserJet printers.

The upgraded version enables users to take advantage of all ports on an HP LaserJet device. It also features multiple paper size support and front-panel control.

The product lists at \$299. The company also displayed a series of desktop laser printers that can be configured four basic ways for specific applications.

The Laserimage 2500 series features emulation for various HP LaserJet II models and operates at 12 pages/min., according to the vendor.

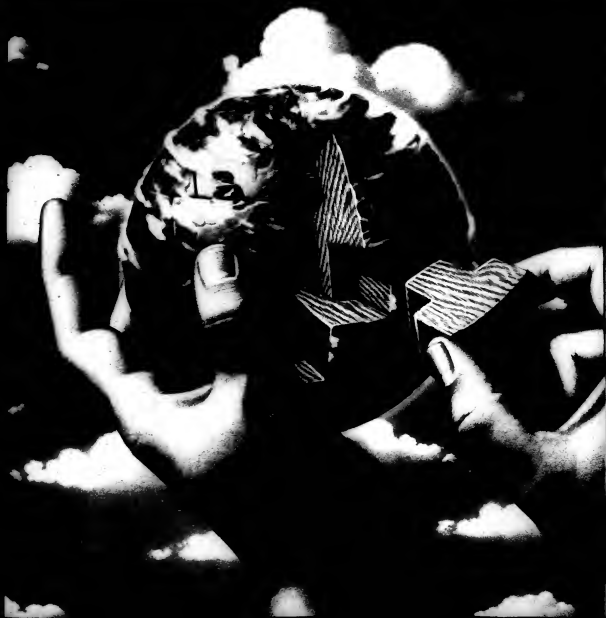
Pricing ranges from \$3,995 to \$4,995, depending on model.

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- ☐ Please send a brochure on the NCR System 3000.
- ☐ Please send a brochure on NCR Cooperation.
- ☐ Please send a brochure on NCR's Open Networking Environment.



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And it aids software developers by speeding both new application development and the extension of conventional mainframe and mini-computer applications.

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OSI	NetWare V7
OSI	NetWare V8
OSI	NetWare V9
OSI	NetWare V10
OSI	NetWare V11
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# NETWORKING

## AT&T boosts T1, T3 user control

BY ELLES BOOKER  
OF STAFF

BASKING RIDGE, N.J. — AT&T recently gave users of its high-speed lines a better way to manage their private networks, announcing a service that allows customers to reconfigure and reserve T1 and T3 circuits from a personal computer.

The Accnet Bandwidth Manager (ABM) works with AT&T's T45 (45M bit/sec.) and T1.5 (1.54M bit/sec.) Accnet services and is a follow-on to AT&T's Customer Controlled Reconfiguration, an on-line provisioning service AT&T has offered since 1982.

ABM fits with several other high-bandwidth network services — increasingly seen as essential for imaging applications, disaster-recovery applications and LAN-to-LAN connections, among other uses — that AT&T and its competitors have been announcing during the past few months.

In two weeks ago, for example, AT&T announced plans for a switched T1 option for its Accnet private-line service. Combined with ABM, users could conceivably arrange for T1 traffic to go over the switched facility, in the event a dedicated line disrupted their conventional

T1s. Users could also redirect downed circuits over alternative AT&T T1s or T3 circuits, if the network is down. In addition, ABM alerts customers to faults and downed links, setting off an alarm on the user's terminal.

AT&T, which hopes to have ABM in 50 cities by mid-1991, said the provision of changes made through the software occur in less than three minutes and that a T1 circuit requested through ABM can be provided in less than one day.

Bandwidth can be reserved at 56K bit/sec. or 64K bit/sec. increments up to a T1 channel, including intermediate rates of 128K, 256K and 512K bit/sec.

### Operator bypass

Regarding the provision of T3 circuits, AT&T said customers will, for the time being, need to reserve these lines through a call to an AT&T operator. But this, too, will be handled by ABM in the future, said AT&T, which hopes to have the T45 Reserved AT&T T3 service ready in 90 cities by the middle of 1991.

Through the ABM software — which requires an MS-DOS PC running Microsoft Corp.'s Windows 3.0 — users connect and disconnect lines, dedicated or dedicated line to an ABM con-

troller in one of AT&T's facilities. The controller, a Sun Microsystems, Inc. Sunserver 490, in turn sends commands to a digital access and cross-connect system in AT&T's network to reconfigure users' circuits.

Bear, Stearns & Co. in New York already has bandwidth and reconfiguration on demand through its internal system, according to managing director of communications Jeff Marshall. He said that if Bear, Stearns migrates to a packet-switched backbone, the ABM service (designed for circuit-switched networks) would be even less applicable to his situation.

Meanwhile, Jim Williams, manager of network engineering at Mervyn's, the Hayward, Calif.-based department store chain, definitely wants flexible bandwidth on demand and would take advantage of the new AT&T service but said he is limited by the front-end processor in his Systems Network Architecture backbone.

"The computer program in the [front-end processor] that has our net configuration would have to be taken down and reloaded," said Williams, who monitors the logical portion of his network with IBM's Netview and physical links with an AT&T Dataphone II controller.

## Britain OKs sharing lines to other nations

BY ELISABETH HORWITT  
OF STAFF

LONDON — Opening the way to less-costly global connections, the UK Ministry of Trade and Industry became the first such body to permit the sharing and reselling of lines between the UK and other countries. The ministry also announced that it will permit two-way very small aperture terminal satellite communications.

"This is a watershed event that changes the whole economics of telecommunications for corporate users," said Leonard Eisenberg, president of Lynx Technologies, Inc., a Little Falls, N.J., market research firm.

A corporation will be able to realize significant savings on U.S.-to-European transmissions by leasing lines from the U.S. to the UK and then either reselling or sharing the cost of those links with other firms, according to Eisenberg.

In addition, a whole new industry will spring up as private corporations and network service vendors "can get a large chunk of bandwidth and parcel it out to users," said Douglas Fields, manager of telecommunications at United Parcel Service's Information Services Division. Such providers "can make

some money and still sell at lower costs" than traditional direct-dial and leased-line rates, he added.

Fields said UPS will look very closely at all three options that the UK ministry's decision has opened up: purchasing circuits from resellers, leasing its own lines and reselling them and sharing lines with other companies. "We could resell lines to our customers; we can have the same relationships with them that go beyond sending packages."

### Follow the leader

Other European administrations, particularly those in France, Germany, Spain and Italy, are likely to quickly follow the UK's lead, Fields said.

"Those countries are in the throes of deregulation and hungry for business; they don't want people moving all their traffic through the UK," Fields added.

As long as the UK is the only country that permits sharing and reselling of bandwidth, it will be much more cost-effective for U.S. businesses to route their traffic through a shared line to a UK gateway to other countries than to set up separate connections to European nations, Eisenberg said.

## Airline training takes flight with LANs

### ON SITE

BY JIM NASH  
OF STAFF

VANCOUVER, B.C. — In a darkened room, the pilot trains, mouse in hand. Next to the aviator, in another cubicle, sits a mechanic who is brushing up on maintenance procedures.

They and 10 or so other hushed Canadian Airlines International employees are using the company's new training facility here. Three identical facilities are located in the airline's Toronto center.

Each center resembles an elegant airport control room. Each trainee sits wearing headphones in front of large color VDTs, pointing and clicking through multimedia video courses.

Canadian Air's training program is heavily dependent on local-area network technology. In fact, said Don Gerke, one of the program's creators, after looking at the mainframe solutions other airlines used for training, he concluded that LANs alone of-

fer the throughput and flexibility to teach individual employees efficiently.

Gerke, project pilot for the airline's advanced training system, said Canadian Air's 5-month-old Ethernet LAN allows trainees to move at their own pace through government-mandated lessons stored on a shared database. The system replaces a low-tech training program that included audiovisual classroom instruction.

He explained that the more rigid mainframe systems other airlines use can hold the progress of an entire class to the pace of the slowest trainee. Allowing trainees to move through their courses independently gives Canadian Air flexibility in scheduling.

This, according to Jean Pierre Deshaies, manager of Canadian Air's simulator systems development, is expected to save \$10 million in personnel costs over four years compared with what executives expected to spend by using mainframe-based training. Deshaies said the firm's training

program so far has cost \$4.5 million and is under budget. Delayed schedules, a fact of life when teaching groups in union, can cost \$20,000 per day for a class of 20, he explained.

using simulators in training for the "glass cockpit" of the Boeing Co.'s 767 and 747-400 and Airbus Industrie SA's A320 — planes in which pilots monitor an increasing number of

The Hewlett-Packard Co. workstations that trainees use display simple computer graphics and high-quality videotaped snippets of airliners. The graphics represent each component, switch and keyboard in a plane that is serviced by mechanics or used by pilots. Employees use a mouse to answer questions about their functions and perform tasks such as extending flaps.

"You don't need a plane to train anymore," Gerke said. What Canadian Air did need before installing the new hardware and software, was a standards-based network with enough throughput to distribute data and digital audio simultaneously to a group of independent courseware users.

"We have a real hodgepodge of technologies in the training world, a lot of which is proprietary and poses compatibility problems," he said. "Canadian Airlines wanted to be hardware independent."

Wicat Systems, Inc. in Orem, Continued on page 50

### Canadian Air relies on LANs to individualize training

Just as important as savings, said John Lok, a consultant on the project, is trainee acceptance, which has been high. The mechanics and pilots are

VDTs as computers fly the aircraft. Virtually every portion of many flights today is done by computers using data keyed in by pilots.

## Tools offer way to save internetworking costs

Enterprise Router is bridge/router alternative

BY JOANNE M. WEXLER  
CW STAFF

IBM users can buy themselves a little time for making large investments in internetworking equipment, thanks to a couple of recent innovative announcements from Micro Tempus Corp. and Micro-Integration.

Walham, Mass.-based Micro Tempus is shipping the Enterprise Router, a software product that sits in VTAM on an IBM MVS-based mainframe and serves as a bridge/router alternative for connecting multiple Microsoft Corp.-based local-area networks through the mainframe. VTAM is IBM's front-end access control program.

Enterprise Router allows an existing Systems Network Architecture (SNA) network to serve as a LAN internet with one investment — \$20,000, to \$100,000, depending on the mainframe processing capacity — instead of buying multiple source-routing bridges for linking each

local area network.

The trade-off is that the software gobbles processing power, "so candidates for the product are organizations not running heavy-duty applications — such as transaction processing —

**E**NTERPRISE Router allows an existing Systems Network Architecture network to serve as a LAN internet.

through the software," said Tucker McDonagh, president of South Norwalk, Conn.-based consultancy Tucker Network Technologies, Inc.

Southern Illinois University in Carbondale, Ill., has been using the Enterprise Router for six months and was previously a beta-test user.

"We had extensive SNA networks that we needed to tie into our LANs," explained Larry Hengehold, director of computing affairs. Hengehold explained that SIU's data center contains an IBM 3090 mainframe, and the university runs more than 50 LANs "of all shapes and sizes."

According to Hengehold, the router software is beneficial in that "not all organizations can afford to buy all the bridges they need at one time. This has been a lifesaver for us by allowing us to build a general-purpose 'bridge' for a while and control our expenses."

Hengehold added that the mainframe has burned "negligible" processing power because of the Enterprise Router, "though we're only six months into it."

SIU fits McDonagh's user profile, as it uses the software for light applications, including electronic mail; nighttime backup and recovery; and the exchange of small to medium-size data files.

SIU does run some Apple Computer, Inc. AppleLink and Novell, Inc. LANs, which are not yet supported by Enterprise Router. Those LANs link to the SNA network over a campus Fiber Distributed Data Interface backbone network using Cisco

Systems, Inc. AGS+ routers, Hengehold said.

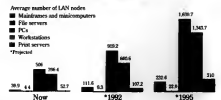
Micro-Integration in Friendsville, Md., is shipping software — dubbed Blue Lynx — that allows four gateways to be combined into one Intel Corp. 80286-based personal computer to interface multiple IBM Netbios-compatible LANs running 5250 emulation with IBM's Ap-

col, such as Novell. Users have been frustrated by this.

Doug Goldstein, LAN administrator at Vyrx Telecom, Inc., a long-distance carrier in Houston, is using the previous version of Blue Lynx to tie his Banyan Systems, Inc. Vines LANs into two interconnected AS/400s. He said he is eager to receive his \$595 upgrade.

### LAN booster

Projected LAN growth spurts will naturally drive the market for equipment to interconnect networks to each other and to hosts



CW Chart: Dennis St. John

plication System/400 midrange computer.

"The more equipment you can connect to the AS/400, the better," McDonagh said. "The AS/400 is a strategic platform, and it has been difficult to gateway into it from nonnative proto-

"Being able to put four gateway cards into one dedicated PC means I won't have to tie up a PC per gateway," he said. "Right now I'm running two gateways on one PC and another gateway on another. This will free up a \$2,000 PC for me."

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## 3Com® EtherLink 16



## Net managers look with favor on 3Com alliance

BY JIM NASH  
CW STAFF

Network administrators expressed optimism about 3Com Corp.'s announcement this month that it will ally itself with Palindrome Corp., a third-party manufacturer of tape backup devices.

The partnership is expected by some network managers to result in a write-once read-many (WORM) device bundled into 3Com's 3+Open network operating systems. However, the political implications of the Santa Clara, Calif., networking company establishing third-party relationships has also sparked enthusiasm.

Palindrome, in Naperville, Ill., now builds tape backup devices exclusively for networking giant Novell, Inc. A spokesman for the 2-year-old company said the two firms are co-developing memory backup systems to run on Microsoft Corp.'s LAN Manager network operating system, which underlies 3+Open.

Don Barry, network adminis-

trator at Ochsner Medical Institutions in New Orleans, said 3Com users are likely to be more heartened by the news of third-party support than by the possibility of WORM backups.

"It means we won't be running in a vacuum," Barry said. He pointed to the myriad third-party relationships that Microsoft and Novell cultivate. The relationships, he explained, give users confidence that a vendor's product has staying power. They also sometimes mean greater affordability.

### Attitude problem

"For the longest time, 3Com had this big attitude: 'We have the best, and no one can come close to us,'" said Fred Skrotzki, supervisor of software development and hardware integration at Jam, Inc. "But if you couldn't afford a 3Com [backup device], you had to go to another vendor, like Novell." Jam is a software developer in East Rochester, N.Y. Skrotzki said 3Com users whose budget could not absorb the approximately \$7,000 sys-

## Users seek Novell bridge options

BY JIM NASH  
CW STAFF

With Novell, Inc.'s protocol bridge lurking somewhere in beta testing, network managers are turning to third-party solutions to unify heterogeneous computer environments.

Some administrators said they are frustrated by frequent updates to Novell's internet packet exchange (IPX) networking protocol. Those acutely affected are managers who are required to have the company's network operating system, Netware, work closely with machines using Transmission Control Protocol/Internet Protocol (TCP/IP).

Provo, Utah-based Novell told users when it announced

Netware 386 in May 1989 that IPX-based Netware 386 had been architected to accommodate a bridge between the two protocols. The company has yet to say when it will deliver such a tool.

### Out of beta

However, according to a manufacturing sector user of Netware who requested anonymity, Novell executives said a bridging device is out of beta testing and will be distributed to a select number of users before the end of the year. Analyst Craig Burton at Clarke Burton Corp. in Salt Lake City said he, too, had heard that the product has been in beta testing.

The user said his peers dislike being at the mercy of frequent IPX updates and would rather run TCP/IP packets on Netware networks via a bridge.

One firmware product that addresses the problem, SK-Net by Schneider & Koch in Karlsruhe, Germany, is gaining grudging endorsement.

At the moment, SK-Net is one of the few servers available to test managers who must reconcile heterogeneous environ-

ments enough to share files and electronic mail.

David Walker, network services manager at the University of California at Irvine, said he purchased several SK-Net smart Ethernet adapter cards. The cards "know how to tunnel IPX inside TCP/IP," Walker said. The cards, which cost \$1,500 each, wrap TCP/IP packets in IPX envelopes in order to transmit them to Netware servers or other TCP/IP systems such as Unix, where they are unwrapped again.

Though the process of wrapping and unwrapping packets is prone to degradation, he said, SK-Net beats other alternatives. Walker said he rejected gateways between the two protocols because of the performance hit the system took.

Rebooting is necessary, Walker said, when switching between protocols.

The SK-Net itself is not without problems, Walker noted. He explained that he has been unable to get the boards to recognize more than one other board on the network, making distributed processing difficult beyond pairs of servers.

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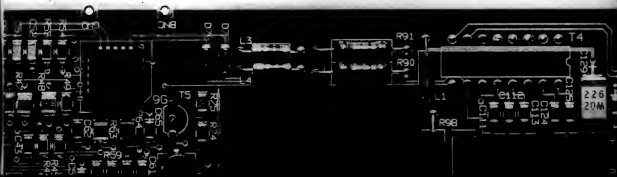
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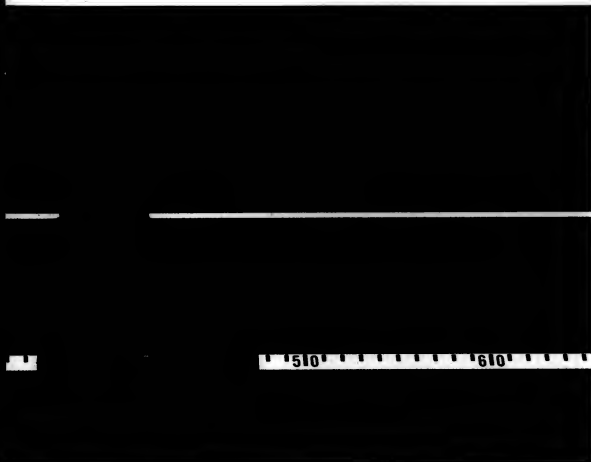
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# PC software melds four telecom tasks

BY JOANIE M. WEXLER  
CW Staff

Many diversified global companies still must deal with the realities of seemingly old-time technologies — Telex and TWX — as the premier mode of communications in some corners of the world.

One user recognized the need for combining those methods with facsimile and modem communications, and the result is an integrated personal computer software package that IDR Union, Inc. in Plymouth Meeting, Pa., is now shipping.

The product, Via PC Telecommunications Computer, runs on IBM PCs and compatibles, including laptops — and uses one common user interface for the four communications modes. It includes such menu items as a list of country codes from Albania to Zimbabwe, as well as time zone differential for 190 countries. Installation time is five to 10 minutes, the vendor said.

The product, which is available for DOS platforms only, requires 640K random access memory. Thus, an Intel Corp. 80286-based PC must be dedicated to running the software.

The product was functionally designed by users. The impetus for it came when Ingersoll-Rand's Engineered Pump Division said it was looking to

streamline its Telex procedures.

"We had a full-time Telex operator who would retype messages scribbled by users," explained Greg Stauffer, PC coordinator. "We were handling each message several times, and this was inefficient."

Stauffer explained that with the company doing business in the U.S., Europe, the Middle East and the Far East, its primary overseas form of communication is Telex, and in the U.S. it is fax. He said the company could not find anything commercially available on the market to integrate these functions, so it approached Gary Edling, then founder and president of International Business Refile, a store-and-forward Telex and TWX switching service. Edling is now president of IDR Union.

The result was a product that "acts for any type of document in a specified directory every 15 minutes," Stauffer said. "When it finds one, it dials a modem automatically and directs the document to a fax, Telex or TWX number."

He added that 180 of his 300 PCs are attached to a network, "any type of IBM 180 or compatible," through the dedicated Via PC server. He added, though, that his site license allows 10 users to simultaneously activate the software; others trying to transmit at the same

time have to wait in a queue.

Larry Cynar, an analyst at San Jose, Calif.-based research firm Dataquest, Inc., said, "I would think there would be a pretty good market for such an integrated package. However, some services, such as Western Union's Telex, will perform this function for you already. What happens if the user already subscribes to such a service independent of the software?"

## More modems

Cynar said that while he sees a lot of fax replacing Telex and TWX, "modems are everywhere." He estimated a 1 million-node-per-year worldwide growth in modems from 1 million in 1989 to 5 million in 1991, particularly at the low end, which is not yet saturated. "However, there's virtually no continuing development of large networks on analog modems," he said, citing the home market as the biggest target for the products.

Edling estimated that Telex and TWX will be around for at least 80 years "because of the billions of dollars needed to upgrade telecommunications systems." He said a version of Via PC for Novell, Inc. Networkware is planned by year's end. "We will also be developing the package for other network operating systems."

Teleprocessing Products, Inc. has introduced a fractional T1 multiplexer that can be configured with one to eight channels.

The TP-9000 can be used as a point-to-point T1 multiplexer or as a fractional T1 multiplexer when used with a common carrier's fractional T1 service.

The product provides as many as eight V.35 terminal interface channels in a 56K bit/sec, constant or controlled carrier as well as 64K, 128K, 256K, 384K, 512K and 768K bit/sec configurations.

Pricing ranges from \$3,365 to \$6,380.

Teleprocessing Products  
4565 E. Industrial St.  
Sunnyvale, Calif. 94065  
(408) 532-8147

## Customer-premises equipment

Network Equipment Technologies, Inc. has announced a product that allows companies to extend public, private or hybrid networking services from central to remote company locations.

The Adm/48 Integrated Access Modem can be used to multiplex voice and data applications onto T1 facilities for access into a public carrier network or

## BIT BLAST

# Nynex group explores digital radio technology

Nynex Science and Technology has applied to the Federal Communications Commission for an experimental license to test and evaluate the feasibility of using digital radio technologies as an alternative for existing wire methods of transmitting telephone calls. Deployment of wireless services could potentially lower the cost of local loop connections, Nynex said.

Open systems vendor The Wallingford Group, Inc. has reportedly signed a value-added reseller (VAR) agreement with Walker Richer & Quinn, Inc., a developer of data communications software, to allow Wallingford's Transmission Control Protocol software to MS-DOS machines to be incorporated in the VAR's networking products.

Connections in Fullerton, Calif., has published a Network Product Guide, a 150-page compendium of 400 products in the areas of Apple Computer, Inc. Macintosh local-area networks, Macintosh links to Digital Equipment Corp. VAXs, Macintosh-to-Voice connections and Macintosh-to-IBM connections. The guide is priced at \$19.95, plus \$2 shipping.

The midyear edition of *EDI Yellow Pages*, published by EDI, Spread the Word in Dallas is now available. The publication contains listings of electronic data interchange vendors, service companies, users, consultants and other organizations worldwide.

## Airline

FROM PAGE 45

Utah, and Seattle-based Boeing have created much of the market's software and hardware. Wain's proprietary setup, however, makes running any other vendor's software almost impossible. Gerke said it also limits the number of Intel Corp. 80386-based personal computers that can log on to a central mainframe or minicomputer simultaneously.

In each of Canadian Air's four training rooms sits a Compaq Computer Corp. Syntempo as a file server. The Syntempo stores audio data and controls up to 16 videorecorders on each trainee's desk. A Cogent Data Technologies, Inc. E/Master II 16-bit adapter card is slotted in the server, which also ports an Extended Industry Standard Ar-

chitecture (EISA) bus for added throughput. The network operating system is Novell, Inc.'s Network Version 3.1 on Ethernet, which was installed in July.

Both Deshaies and Gerke said they were surprised by the Cogent card's performance. "It blew the socks off Novell's NE3200 32-bit card," Deshaies said. The Cogent card takes control of the EISA bus to guide data flow without having to go through the CPU, Gerke added.

One card on a server, Deshaies said, can support up to 16 users concurrently. "We were worrying that we would have to go with [Fiber Distributed Data Interface] in order to put that many trainees on one server, each of them accessing data, video and audio. Now, be said, the only talk of FDDI is in running a backbone between the existing training room with the second one being built down the hall.

into a company's private backbone network. It supports public carrier service offerings ranging from fractional T1 to fully loaded T1 lines, the vendor said.

Pricing ranges from \$3,100 to \$4,200 for eight-, 12- and 24-slot models.

Network Equipment Technologies  
800 Saginaw Drive  
Redwood City, Calif. 94063  
(415) 366-4400

Timeplex, Inc. has announced an intelligent networking system that enables customers to connect remote sites to backbone networks.

The TX1/Access System was designed to handle AT&T Database Digital Service switched 56K bit/sec., fractional T1 and T1 requirements. It provides two- and four-wire connectivity and is available in three models: the eight-slot TX1/8 for small access sites, the 12-slot TX1/12 version for intelligent channel bank applications and the 24-slot TX1/24 for large access sites.

Pricing ranges from \$3,150 to \$16,500, depending on type of equipment.

Timeplex  
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Woodcliff Lake, N.J. 07675  
(201) 930-4607

## NEW PRODUCTS

### Local-area networking hardware

Commex, Inc. has introduced a fiber-optic interface designed for use in multimedia local-area network environments.

The CX-80 acts as a central controller for connecting audio, video and data resources, which can then be distributed to attached personal computers. A complete Integrated Services Digital Network Primary Rate Interface for voice and data, as many as three television channels and one channel for data are linked to the fiber-optic connection via a multiplexer.

Pricing begins at under \$10,000 per workstation. Commex  
1655 Crawford Blvd.  
Crofton, Md. 21114  
(301) 721-3666

Puredata Inc. has announced three Ethernet cards that feature support for 10Base-T.

The products, part of the 8023 series of Ethernet cards, include the PD18023-T1 (\$345), an eight-bit interface card designed for IBM Personal Computer XT's and AT's; the

PD18023-16T1 (\$395), a 16-bit card for AT- or Intel Corp. 80386-based file servers and workstations; and the PD18023-T2 (\$475), a 16-bit interface card for IBM Micro Channel Architecture-based file servers and workstations.

All three models are compatible with the IEEE 802.3 Ethernet standard.  
Puredata  
1740 S. 1-35  
Carrollton, Texas 75006  
(214) 242-2040

Ancor Communications, Inc. has announced a local-area network system based on fiber-optic technology.

The CXT for LAN-based systems was designed for personal computer-based LANs. It runs transparently under Novell, Inc.'s Network 386 and enables each workstation on a LAN to communicate at 44M bit/sec. The list price is approximately \$2,000 per connection.  
Ancor Communications  
6130 Blue Circle Drive  
Midland, Texas 79701  
(512) 932-4000

### Front ends, multiplexers

# MANAGER'S JOURNAL

## EXECUTIVE TRACK



Virginia M. Alster has been named manager of systems and programming at the South Carolina State Port Authority in Charleston, S.C.

Alster was previously associate director of information resource management at Colgate-Palmolive Co. She managed a 15-person strategic planning group and led the development of domestic and international systems.

She holds a bachelor's degree from St. John's University and an MBA from Adelphi University.

Nader Kury has been named principal systems analyst for the city of Berkeley, Calif. He will be responsible for implementing a financial management system.

Kury was formerly a programmer/analyst at the Alameda County Water District in Fremont, Calif.

Ariel Sharon at Argonne National Laboratory in Argonne, Ill., has been elected vice president of industry at the Society for Computer Simulation (SCS).

SCS is a professional technical society devoted to applications of computer simulation. SCS members include employees of computer simulation firms, military and defense contractors and hardware and software vendors.

Sharon is group leader for experiments in Argonne's Reactor Engineering Division. He develops software for training nuclear power plant operators.

### Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

## Exploring uncharted waters

Spencer Gifts develops SIRIS, a \$5 million integrated database system, from scratch

BY JOANIE M. WEXLER  
CHIEF STAFF

There's a credo that the best managers are those who work their way up from the trenches, because they understand precisely what their subordinates' jobs entail. Spencer Gifts, Inc. is betting the success of a five-year business overhaul project on that very premise.

With a total of 45 years of retailing experience between them, Spencer's chief executive officer and vice president of information systems are managing their current Spencer Integrated Retail Information System (SIRIS) project with a dose of realism.

CEO John Halcas and Vice President of Information Systems Eugene Murtha say their experience allows them to take an idea and visualize it running through the entire Pleasantville, N.J.-based corporation. That ability helped them conceive and appropriately design SIRIS, an integrated database system aimed at giving buyers and merchandising managers up-to-the-minute information about sales trends.

"I've been a buyer and a merchandising manager, and I understand what information these people need to do their jobs," Halcas explains. "The quicker you can pick up on a trend, the more you can maximize the benefit of that trend."

Halcas gets actively involved with IS planning decisions at the \$260 million specialty retail chain. Spencer Gifts has been owned by MCA, Inc. since 1968 and operates about 550 stores in shopping malls nationwide.

"We have a formal structure for



Spencer Gifts' Halcas (left) and Murtha manage SIRIS development

keeping John constantly involved," Murtha says. "He is the type of manager who walks around the building and talks to people; he keeps his pulse on everything, including IS."

Halcas' hands-on involvement with IS is "unusual, particularly in the retail industry," according to John Clay, former vice president of IS at the National Retail Federation, Inc., sponsor of the Retail Information Systems Conference (Risccon).

Halcas spoke about Spencer's SIRIS project at Risccon's annual conference in mid-October in St. Louis.

"You'd never hear a CEO say he wasn't going to get involved in site selection or operations, and the computer is another strategic tool," Halcas says. "You don't have to be a hardware or software expert, but you should know the benefits of different kinds of systems and what questions to ask."

Continued on page 56

## Perhaps IS needs a dose of perestroika

BY CLINTON WILDER  
CHIEF STAFF

Looking for a role model for redesigning your information systems organization to meet user needs? Try the Soviet economy.

That unconventional wisdom comes from Dean Meyer, president of NDMA, Inc., an IS management consultancy in Ridgefield, Conn. Meyer argued that in the spirit of the lifting of the Iron Curtain, some IS departments would do well to emulate perestroika, or restructuring.

According to Meyer, "Most IS organizations are run by a central Soviet that determines how time and money will be spent." He adds, "It didn't work in Eastern Europe, and it isn't

working in today's corporations."

The IS department should change from a centrally planned economy to a market-driven economy, Meyer said, by giving users more say in what IS services they want and pricing them accordingly.

Implementing chargeback and managing IS as a profit center are important pieces, but they are part of a larger philosophy.

IS activities "should be planned by the customer instead of by the provider," Meyer said. "Then IS will only do what the clients are willing to pay for. The way things work now, we have surpluses [of IS services] in some areas and shortages, or backlogs, in others."

Meyer advocated a process of what he calls shadow budgeting, or distributing the projected IS budget among

users so they each know what they are paying for. To reach that point, the IS department should take steps, including the following:

- Identify the IS department's "product line."
- Identify all suppliers, external and internal.
- Determine a "fair market price" for IS services based on their cost of delivery and what prices are offered in the open market (i.e., by outsourcing vendors).

Design an invoicing process so users will "start to get a feel for what their decisions cost," Meyer said.

If successful, the process will reinvigorate IS and transform the users from supplicants to "well-informed buyers who want quality," according to Meyer. And perhaps their role models will be the customers at the McDonald's restaurant in Moscow's Red Square.



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## CALENDAR

The changing nature of telecommunications vendor/user relationship is the theme of the International Communications Association (ICA) 1991 winter seminar to be held Jan. 13-16 in Houston.

The evolution of outsourcing and global networking partnerships will be covered by speakers from both the user and vendor communities. Speakers from user companies will include Bruce Turkstra of Merrill Lynch & Co., Bud Turner of McKesson Corp. and Woody Randall of Citizens & Southern National Bank. The keynote speaker will be University of Minnesota Prof. James C. Weatherbe.

For more information, contact the ICA in Dallas, Texas at (214) 233-3889.

## JAN 6-12

**International Security Conference and Exposition West '91.** Anaheim, Calif., Jan. 9-13 — Contact: Calvert Exposition Group, Des Plaines, IL (708) 299-9011.

**Mathematics Conference.** San Francisco, Jan. 13-15 — Contact: Mary Kendall, Walton Research, Champaign, IL (312) 366-0700.

## JAN 13-19

**Pacific Telecommunications Conference: Assessing the Global Network.** Honolulu, Jan. 13-14 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

**National Rural Industries Build Industry Convention and Exposition.** New York, Jan. 13-16 — Contact: NRI Convention Register, New York, N.Y. (212) 563-5115.

**Technical Conference on the X Window System.** Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8881.

**Telecom Skills Workshops.** Honolulu, Hawaii, Jan. 17-18 — Contact: Pacific Telecommunications Council, Honolulu, Hawaii (808) 941-3789.

## JAN 20-26

**Early Vision '91.** San Francisco, Jan. 20-23 — Contact: Early Systems, Westlock Springs, Canada, Calif. (415) 254-0900.

**The Benchmarking Conference.** San Francisco, Jan. 21-23 — Contact: Digital Consulting, Andover, Mass. (608) 470-1880.

**State Technical Conference.** Dallas, Jan. 21-25 — Contact: Texas Conference Office, El Paso, Calif. (714) 588-8648.

**Infonet '91.** Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infonet Publishing, Capistrano Beach, Calif. (714) 493-3434.

**Uniforum 1991.** Dallas, Jan. 22-24 — Contact: Bob Lauer, PESMCO, Des Plaines, IL (708) 299-3131.

## JAN 27-FEB 2

**Communications Networks '91 Conference and Exposition.** Washington, D.C., Jan. 28-31 — Contact: Michael Sullivan, World Expo Corp., Farmington, Mass. (508) 828-5288.

**Network Computing Forum and Exposition.** Washington, D.C., Jan. 29-31 — Contact: Charming Expositions, World Expo Corp., Farmington, Mass. (508) 828-5288.

## FEB 3-9

**Macrop Conference.** Phoenix, Feb. 6-8 — Contact: Macrop Developers Association, Everett, Wash. (206) 253-0948.

**Manufacturing '91.** New York, Feb. 5-7 — Contact: Peter Kropfen, Exposition Management, Waltham, Mass. (617) 790-6432.

**Florida Educational Technology Conference.** Tampa, Fla., Feb. 5-8 — Contact: Barbara Ann Cox, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

**NOMIA West Regional Convention.** San Diego, Feb. 7-9 — Contact: Kety Dine, NOMIA, Kansas City, Mo. (816) 941-3100.

## FEB 10-16

**Videa Expo.** San Francisco, Feb. 11-15 — Contact: Debbie Resnik, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

— Contact: Judy Koch, Plymouth, Mass. (617) 420-5378.

## FEB 24-MARCH 2

**IEEE Conference on Artificial Intelligence Applications.** Miami Beach, Fla., Feb. 24-28 — Contact: IEEE Computer Society, Washington, D.C. (202) 371-1813.

**Communications Connections (Comnetex '91).** San Diego, Feb. 25-27 — Contact: Dimensions, Redwood City, Calif. (415) 591-4343.

**San Open Systems Expo.** Houston, Feb. 25-27 — Contact: San Open Systems Expo, Austin, Texas (512) 331-7781.

**Compucon Spring '91.** San Francisco, Feb. 25-March 1 — Contact: Roger Anderson, Livermore, Calif. (415) 422-8572.

**BN and the Law '91.** Washington, D.C., Feb. 26-27 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 544-7905.

**Financial Market Data Conference.** New York, Feb. 26-27 — Contact: Waters Information Services, Binghamton, N.Y. (607) 775-0088.

**Strategic Planning Systems Conference.** Tempe, Ariz., Feb. 27-March 1 — Contact: Peter Asher, Coordinator, Harbort Associates, Lebanon, N.J. (201) 730-9444.

## MARCH 3-9

**Communication Technologies Conference '91.** Washington, D.C., March 6-7 — Contact: Jim Seple, Technology Interchange Group, Clifton, N.J. (201) 479-3606.

**East Coast Oracle User Resource Conference.** Washington, D.C., March 6-8 — Contact: Dale Lowery, Oracle User Resource, Washington, D.C. (202) 254-4864.

**Open Systems Explained — The Management Issues.** London, March 7 — Contact: Sany Mayhew, London, England (071) 238-6380.



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## CLIPS



The Lens

Summaries from leading scientific and management journals

### "The elusive silver lining: How we fail to learn from software development failures"

By Tarek Abdel-Hamid and  
Stuart Madnick

Sloan Management Review  
Fall 1990

■ When software projects go awry, we either hide the mistakes or never discover them. The important lessons to be learned from failures are usually not readily apparent; they need to be extracted from deep within the project experience.

Many managers rely on conventional wisdom to explain failures, such as

Brooks' Law, which says that adding manpower to a late software project delays it further. But reliance on these intuitive explanations may prevent managers from identifying the real problems.

The authors have developed a post-mortem diagnostic tool that simulates the software development and testing process. For example, it can determine whether the project was understaffed or whether quality-assurance testing continued beyond the point of diminishing returns.

The result is a set of ideal cost and schedule estimation benchmarks for the finished project that can be used to improve estimates for future projects. The payoff from an effective post-mortem is a smarter organization that truly learns

from its mistakes. — Mitch Betts

### "Systems architecture: Identifying strategic strikes"

By Randall Latham

Journal of Systems Management  
October 1990

■ "Strategic strikes" are competitive advantages gained through new uses of information technology. However, such advantages are fleeting if the technology can be quickly replicated by the competition.

New strategic strikes can be discovered through systems architecture. Systems architecture involves comprehensive analysis of the company's current and long-term needs and resources. It deals with all aspects of technology — business function, application, data, communications and hardware. Thorough systems architecture, needs can be anticipated and provided for in advance; it is active rather than reactive. Information technology can thus be more effectively and efficiently employed.

For competitors that are not employing similar analyses, strategic strikes made through this type of planning are more difficult to replicate and neutralize.

The greatest barrier to implementation of systems architecture lies in the resistance of any organization to technological change. The strikes enabled by a well-thought-out systems architecture must be put in place at a rate acceptable to the employees. — Derek Slater

### "Why be honest if honesty doesn't pay?"

By Amar Bhidé and Howard Stevenson  
Harvard Business Review  
September-October 1990

■ Is honesty the best policy? That is a question that has long plagued society, and never more so than now. We know honesty is a moral choice. Most people tell themselves that in the long run, honesty will pay, and those who are dishonest will get their just desserts. But the truth is, there is no evidence to prove such a belief.

In fact, there is greater reason to believe deception pays. For example, in an interview with *Inc.* magazine, Philippe Kahn explained how his firm, Borland International, got off the ground by deceiving an ad salesman for *Byte* magazine. The then-broke company was able to secure good credit terms for an ad by appearing as a busy, venture-backed company.

That ad sold \$150,000 worth of software.

As morally conscious people, we hope that when someone cheats, steals or breaks contracts or promises, the result will be alienation. Getting even would seem to satisfy the slightest, but it takes valuable energy to retaliate while incentive for doing so is nonexistent. In other words, it is a good business practice to turn the other cheek.

Given this, we would expect breaches of trust to be rampant, but that's not the case. Businessmen keep their word because they want to, not because honesty pays. It is the absence of predictable financial rewards that makes honesty a quality prized in the business environment, and as long as the rest of us live by this, the system will be fine. — Jodie Naze



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## COMMENTARY

Clinton Wilder

## Obfuscating outsourcing

How can you tell when a new direction in information systems management has turned into a full-

fledged trend? The number of outsourcing, market research studies and consultants specializing in the topic are all good indicators, but best of all is the Buzzword Test.

If a new phenomenon has developed at least five new clichés or buzzwords around it, it can be officially considered a trend. I'm defining buzzword as something that sounds nice when you say it but either oversimplifies an issue to a great degree or goes so far as to hide the truth. Examples are "solutions," "standards," "open systems" and "no new taxes."

Well, outsourcing has officially passed the Buzzword Test.

I'm not sure exactly when this occurred or what particular press release put it over the top, but what follows is one observer's annotated list of the Current Five Greatest Outsourcing Cliches — culled from the ranks of companies who have outsourced some or all of their IS operations. This is not a criticism of the trend, which has been and will continue to be used very effectively by many firms. Just consider it a vote for telling it like it is.

This arrives just in time for the holiday season. Watch for the sequel next summer.

1. "We're in the widget business, not the data processing business. So it makes strategic sense to focus on widgets and let the DP experts [outsourcing vendors] worry about DP."

This may be true if you're talking only about fairly simple data center operations. But if you mean large pieces of applications development and strategic IS planning, doesn't this fly in the face of integrating IS with the business instead of relegating it to traditional back-office status?

2. (Corollary to #1) "We wouldn't outsource if we were in an information-in-

tensive business like airline reservations. But our business is making a better widget; worrying about computers is not a strategic focus for us."

Hoo boy, are these guys missing the point. There is not a business on earth that does not rely on information. Many of the most impressive leaders in the use of IS — Brontosaurus, Pterodactyl, H. J. Heinz IS consultant, Wal-Mart Stores — are not in the traditional "information business" — or are they? They have made information strategic in their respective industries and have proven that you don't have to be Dun & Bradstreet or Coca-Cola to do so.

That doesn't mean outsourcing and strategic information use are mutually exclusive. At a recent Profit-Oriented Systems Planning Program cosponsored by IBM and Spencerville, Phil Lichtenfels took issue with a previous speaker's slide that implied outsourcing was more appropriate to noninformation businesses. "Information is important to all companies," he said. "Heinz has outsourced IS operations to Genis."

3. "Our IS employees clearly don't have much of a career path in the widget

industry. We think they'll be very excited to transfer to the outsourcing vendor and have the opportunity to advance in their own field."

This particularly bothers some idea comes after all the talk about how IS technologists must better understand their company's business and feel like they really do work for Widgets, Inc. and not for IBM. I sure sounds like the old, "I'll worry about the business, you go play with your Cobol and DASE" to me. And then they wonder why systems don't meet business needs.

Transferring employees to the outsourcing vendor is tough stuff. Uncertainty, clashing corporate cultures, new bosses and a highly productive rumor mill will be constantly battering morale. To make it work, management had better be sensitive to the above concerns, not thinking that they're rearing their IS employees a big career advancement favor — especially the IS director who gets the new title of "vendor liaison."

4. "We're looking forward to this relationship with our strategic partner."

I've addressed this one a few times before. Maybe it's just

semantics, but the bottom line is that outsourcing is a vendor/customer relationship. One party is paying the other for services. Can it be non-adversarial, cooperative and beneficial to both parties? Yes, absolutely. But never forget that your "partner" is in the outsourcing business to make money.

5. "The outsourcing vendor's reason for existing will give us access to the latest state-of-the-art technology."

If you're easily wowed by the latest and greatest MIPS cruncher, it's no wonder you thought your IS wasn't up to snuff and you wanted to outsource. State-of-the-art technology can help, but it's the use of the information that makes the difference.

You may have noticed that not one of these five themes mentions the cost savings of outsourcing. That's because it's not a buzzword — it's usually the truth. In these recessionary times, I would think more companies would want to highlight that. But many would rather lose sleep about it, especially since there are so many trendy buzzwords available.

Wilder is *Computerworld's* senior editor, management.

## Uncharted

FROM PAGE 51

Hacala "pride and provokes his managers to gain the necessary knowledge to use IS strategically," Chay says. "Usually, the process is the result that."

About 500 of Spencer's decision makers, including buyers, merchandising managers, distributors and other managers, will have access to SIRIS. The system's goal is to provide one updated copy of corporate information by continually polling individual personal computers at each store and integrating the information into the corporate relational database. The firm can then monitor sales trends for a few days and project a year's worth of sales for an item.

"If a [supplier's] factory can produce just 20,000 items a week and we order 100,000 units, we effectively lock up the sales of that item if we're quick," Hacala says.

Phase one of SIRIS includes a purchase order management system, merchandising controls and a system that allows buyers to track their spending money. It is set to go live in early January.

Phase two will include an automatic item reordering and distribution system and other operational systems. It will take another two years to complete.

The \$5 million SIRIS project required a heavy investment in educating the IS staff about IBM's DB2 relational database system and Microsoft Software In-

ternational, Inc.'s Nomad fourth-generation language (4GL) tool. "The staff also had to learn how to work in a new MIS/user relationship environment," Murtha says.

SIRIS has been under way for three years, and Murtha estimates that the firm has spent \$100,000 to \$150,000 in outside classes and in-house training for the 80-person IS staff. "We didn't expect our staff to work miracles," he says. "When we conceived SIRIS, there were no development tools available for DB2." So the company developed its own set of database management tools and is positioning itself to sell them and SIRIS itself.

Murtha notes that a couple of the staffers who were initially chosen for the SIRIS team "were enamored with their old ways" and elected to leave the firm rather than invest the time and effort in gaining necessary technical skills for the 4GL development. The project demanded.

Those on the SIRIS team "didn't know the swamp was there, and the bridge was washed out," Hacala says. He describes SIRIS as a real Lewis and Clark expedition, "which involved designing the database, writing code, converting existing data to the new system, testing the database and producing documentation."

In addition, Hacala and Murtha created an all-out incentive program for SIRIS developers. If the team delivered

on time, staffers would receive 10% to 25% of their salary as a bonus — depending on position. The project came in on time, the executives say, because in part of "recognizing quality people."

SIRIS should also help Spencer Gilts, a large administrative head count done. SIRIS will initially provide new point-of-sale software to reduce paperwork and allow more administrative tasks to be performed electronically at the individual stores.

The home office will need fewer people to handle such reports," Murtha says. "When you're hiring 8,000 employees at Christmas time, that's a lot of payroll information that previously had to be delivered on paper to human resources and the staffers."

## The last generation

Spencer Gilts may be leading edge in designing retail systems for business benefit, but the company does not claim to be leading edge in technology. Hacala prefers to go with "the last generation of technology. It'll do 85% to 95% of what the new generation will do, and it's a hell of a lot cheaper."

For example, Spencer currently houses its IBM 3081R mainframe in its headquarters, and SIRIS "will be a real resource hog," Murtha says. But Hacala figures that once IBM's new generation Enterprise System/9000 mainframes start shipping in the spring, he'll be able to pick up a 3090 for a comparative song.

## SIRIS-ly speaking

Projects with narcissistic origins can sometimes snowball into unexpected business opportunities. When Spencer Gilts began SIRIS around IBM's DB2 relational database, it discovered that there were no commercially available development tools that were both DB2- and specialty-store-oriented. So the firm developed its own.

Now, Spencer is looking to commercially market the development tools to a joint venture with Microsoft Software, vendor of the Nomad 4GL that Spencer's used to develop its Development Management Tools (DMT). Spencer also plans to market SIRIS itself. SIRIS is being designed, however, specifically to allow Spencer to integrate sales trends and other key information from the firm's 550 nationwide specialty chain stores.

While Spencer Vice President of Information Services Eugene Murtha emphasizes that "we're not getting into software as a primary business," he notes that "in at least five or six percent" are interested in the DMT package. Murtha describes DMT as a "utility that administrators and supports DB2 and also enables some productivity gains in computer operations."

He says that "the situation is sort of analogous to how American Airlines' reservation system came to be a separate business. But this is uncommon in retailing and is an aside for us." Bill Bucci, the IS design consultant who helped develop DMT and SIRIS, "we had the team of several programming consultants to do most of the commercial support for DMT."

"While whatever revenues we take in will be considered gravy, they will help start the payback on our investment in SIRIS and training," Murtha acknowledges.

Bucci and Microsoft Software will handle the DMT marketing and packaging, and Spencer will receive an as-yet-unagreed-upon royalty.

JOANIE M. WEXLER

Murtha also points to Spencer's recent purchase of new diskette drives, portable PCs, America, Inc. PCs with integrated modems for its buyers.

"We've quadrupled our processing capacity but are paying less for it," he says. "That was five years ago," Hacala says.



## Evaluating Workstation Performance: It's a Question of BALANCE

If you were to try to pick a triathlon winner, would you go with the best marathoner? The champion bicycle racer? The Olympic swimmer? Or would you choose the athlete known for being very good overall? The smart money is riding on the all-around athlete known for turning in a *balanced* performance.

Think about how this applies to your work. Say you're wrestling with a workstation purchase decision. You're dazzled by all of the performance claims you've seen and heard. To pick a winner, do you choose the machine with the highest integer or floating-point MIPS rating? Or the machine with blazing graphics performance? And what about I/O speed? Which is more important?

The answer: they're all important. You're not buying a CPU chip, or even a graphics accelerator. You're buying a *system*. It's the *total system*, with all of its attributes, that determines whether the machine will be the best performer for the jobs you need done.

### How to Identify

#### The Balanced Performer

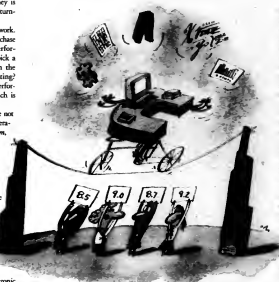
As an example, let's look at a few of the applications you may want to run, and how the different aspects of system performance affect the applications. The following chart shows five typical workstation applications and the approximate degree to which each is dependent on CPU, I/O, and graphics performance.

From this chart, you can see that electronic publishing applications are graphics intensive, CASE applications are CPU intensive, and mechanical and electronic design applications are both graphics and CPU intensive. Business and financial modeling applications, because of their reliance on database access, are extremely I/O intensive.

#### APPLICATION PERFORMANCE MIX

Application	CPU	I/O	Graphics
Business/Financial Modeling	60%	20%	20%
CASE	60%	20%	20%
Electronic Design	30%	20%	50%
Electronic Publishing	20%	20%	60%
Mechanical Design/CAE	40%	20%	40%

Percentage represents average of range.



In use these numbers in your workstation decision, you'll need to factor them against known performance figures for the workstations you're considering. Different applications will produce different run times based on their performance mix and the specifications of the tested workstations.

Now you've got data that shows how individual applications perform on different systems you're considering. But in the real world, you don't use a workstation to run a single application. Most likely, you'll run a set of related tools, and in many cases, you'll be running them at the same time.

This introduces a new selection criteria, because multitasking places significant demands on operating system efficiency, especially in terms of task scheduling. An efficient, mature operating system will allocate CPU resources to the competing applications and keep all of them running smoothly. Less mature operating systems

can cause some applications to bog down, or even stall; graphics may be slow or choppy; CPU-intensive jobs can become severely I/O bound.

### Keeping a "Total System" Perspective

So now you've evaluated how two or three applications run individually on your potential workstations. You've tested the applications running concurrently to judge operating system efficiency. And you've certainly looked at the systems in terms of your own unique needs—applications; industry standards for hardware, software, and communications; the availability and quality of post-sale service and support.

Next you arrive at the big question: Which machine offers better value for your dollar? Based on what you've just learned about overall balanced performance, do traditional price/performance measures really count? Is dollars per MIPS a valid measure on which to base your decision? Or are you better off developing your own measure that judges system performance?

The point of this exercise is to demonstrate the need to take a *total system* view, as opposed to focusing on certain system attributes. When you evaluate systems, you need to look closely at the job at hand (and the applications you'll be running), and evaluate systems based on actual working conditions.

### Be an Informed Consumer

There are tools to help you in your evaluation. Industry-standard benchmark tests are useful, but be aware that even these are limited. Current SPECmark tests, for example, measure only integer and floating-point performance—basically raw CPU performance. (In the near future, SPEC tests will cover CPU, I/O, and multiter performance.) The X11perf test is an accepted measure of graphics performance. Remember, these are all single-stream tests that do not measure operating system efficiencies. You'll have to do that yourself—with your own set of applications running in your environment.

All vendors seek to present the most attractive aspects of their workstation products. Take the performance claims for what they're worth—as indicators of specific system capabilities. Your questions should be: Are these performance specifications relevant to my job? What about next week? Or next year?

In today's changing business environment, a system with balanced performance will stand the test of time.

# STRAIGHT TALK

ON

## VAX and VMS

With the October introduction of new VAX, MicroVAX, and VAXstation products, Digital set forth new directions for VAX and VMS. The focus of this recent announcement was on enhancing VMS openness via standards as well as enhancing VAX performance and price/performance.

Speaking directly to you, our customers, William Demmer, Vice President of the VAX VMS Systems and Servers Group, answers questions designed to offer further insight into the strategies at work behind this very important announcement.

**Question:** Can you explain the new VMS statements of direction?

**William Demmer:** We have presented our intention to further open VMS with the incorporation of X/Open Branding, POSIX, and Open Software Foundation (OSF) standards.

Digital, along with most standards organizations, defines the benefits of open computing in two ways: ease of interoperating our products with other vendors' systems, and ease of moving or porting applications to other vendors' systems.

Thanks to our Network Application Support (NAS) program, we believe that VMS-based systems already lead the industry in ease of interoperating with other vendors' systems—from MS-DOS-based PCs to Apple Macintosh systems, UNIX workstations, IBM mainframes, and CRAY supercomputers.

Recently, we detailed our plans to enhance VMS applications portability also through the NAS program. We believe that the key to portability is standards—not standard operating systems, but standard interfaces.

NAS, as you may know, is Digital's program for delivering these standard interfaces. Over the years, as part of the NAS program, we have added a variety of standards to VMS, such as SQL and the X Window System. Now we intend to add two additional key standard interfaces to VMS—making it an open operating system in the eyes of the world's key standards bodies and making it easier for you to implement an open computing environment with VMS.

*"Digital is committed to protecting your investment in VAX and VMS—now and well into the future."*

**William Demmer**  
Vice President  
VAX VMS Systems  
and Servers Group



X/Open Branding, POSIX, and OSF standards will make it easier to port most UNIX applications to VMS. This means you will have the tremendous functional advantages of VMS with dramatically new levels of portability.

**Question:** What X/Open, POSIX, and OSF standards will be incorporated into VMS, and when will they be available?

**William Demmer:** As I've just mentioned, we have already added a variety of standards to VMS. Other standards are forthcoming, including OSI and OSF/Motif.

In addition, we have previously described our intention to add the first IEEE POSIX standard (1003.1) to VMS. Now we have announced our intention to add all defined POSIX standards (1003.1, 1003.2, 1003.4). All

three will go to field test next quarter and be delivered in 1991.

As you are no doubt aware, X/Open and the Open Software Foundation (OSF) are both non-profit organizations developing widely accepted specifications for open systems. X/Open's Portability Guide (XPG) and OSF's Distributed Computing Environment (DCE) describe environments built upon standard interfaces and designed for open computing. We have announced our intention to provide extensive support for many of these standards. We also intend to add many of the OSF/DCE standards to VMS. Digital has, in fact, already donated four of the eight technologies chosen by OSF to compose the DCE.

We have already added key X/Open standards to VMS, including SQL, FORTRAN, Pascal, C, ADA, and the X Window System. Now we intend to add the other necessary components of XPG3 to VMS in order to receive X/Open Base-System Branding.

Until now, the only software systems which have been XPG3 branded are UNIX systems, including Digital's ULTRIX, IBM AIX, and HP UX. XPG3 branding for VAX/VMS will dramatically level the playing field for VMS in terms of openness.

**Question:** Why are you adding these capabilities to VMS?

**William Demmer:** We are opening VMS for several reasons.

First, you have asked for it. You have always liked the functionality and leadership multi-vendor integration capabilities of VMS. Now, enhanced openness will bring even more flexibility to your VAX system investments.

Secondly, today there are thousands of Digital applications for VMS-based VAX systems. By opening VMS, hundreds of emerging new applications originally written for UNIX-based systems can be added to the list. Using POSIX and XPG3 portability features, you will be able to mix and match hardware to the requirements of a specific application or project—and not have to worry about reworking or retraining. For example, many applications written initially to run under UNIX will be usable in projects requiring the greater data integrity and security that VMS provides via clustering, disk shadowing, automatic system and device failover, and data journaling.

# VMS



"We'll utilize the best available technologies to enhance VAX performance and price/performance."

**Question:** If VMS is open, what unique advantages will it offer?

**William Demmer:** Besides bringing new levels of openness and portability to Digital-based computing, VMS will continue to offer the same unique advantages—data dependability and high availability, networking capabilities, and superior multivendor support. Not to mention over 10,000 superior applications, plus tools designed to cut software development time in half.

From the first VAX to the VAX systems of the next century, VMS will always support compatible system growth, from desktop to data center, without rewriting software. That translates into investment protection for you.

**Question:** What are the new statements of direction for VAX computers?

**William Demmer:** In terms of VAX system capabilities, we will be utilizing the best available technologies to enhance VAX performance and price/performance, as we have been doing ever since the VAX was introduced.

Specifically, we will be phasing in high-performance RISC technology to further accelerate VAX performance. Today's major I/O performance gains in the VAX 6000 Model 500 are made possible by new RISC I/O technology, which we have also recently incorporated into the new VAX 4000 and VAX 9000.

We also plan to incorporate leadership RISC CPU technology into VAX systems over the next two to three years. VAX/VMS systems based on RISC will be comparable with today's VAX/VMS systems.

**Question:** Are we looking at a major shift in VAX and VMS strategy?

**William Demmer:** No. VAX and VMS are based on hardware and software architectures that are inherently designed for growth. We're always adding additional features to VMS. We're also continually moving the VAX hardware architecture to high-performing technologies—from ECL to CMOS, and now to RISC.

We've often stated our commitment to improving VMS software, as well as moving VAX hardware to better performance platforms.

Consequently, it should not be a major surprise when Digital announces its intention to further enhance these extremely feature-rich hardware and software technologies. You should continue to understand that Digital is committed to protecting your VAX investment now and well into the future. This recent announcement offers further proof of that.

**Question:** How does this affect Digital's plans for future RISC/UNIX developments with the DECsystem product family?

**William Demmer:** Our commitment, as always, is to offer leadership in products and technology.

Our DECsystem products have brought leading RISC/UNIX capabilities to desktop computing, graphics, and servers. We're now expanding that leadership back to our VAX/VMS products.

At the same time, DECsystem products, based on MIPS technology, will continue to bring price/performance advantages to the UNIX environment.

Just as important, through NAS we are able to provide you with these price/performance benefits in a unified computing environment—one that includes all Digital systems and systems from other major vendors.

**Question:** What do these new directions for VAX and VMS mean for Digital?

**William Demmer:** We believe that this continued acceleration of VAX hardware and VMS software enhancements clearly surpasses the competition—putting us in a very strong position for the remainder of the decade, and beyond.

You are already familiar with the benefits of VAX and VMS and can easily appreciate the added performance available with the new VAX 6000, MicroVAX 3100, and VAXstation systems. I believe you'll applaud a move that brings more openness to VMS and enhanced performance to VAX.



In Case You Missed the News, Higher Performance VAX, MicroVAX and VAXstation Products Announced

Meet a quick recap of these new products (plus some impressive performance figures)

**VAX 6000 Model 400 starts**  
The new VAX 6000 Model 500 series offers up to 100 percent more performance than the Model 400 series—for only a 16 to 18 percent higher price. It spans the performance range from 13 to 72 VUPs. The VAX 6000 Model 500 has triple the I/O performance and twice the memory of previous VAX 6000 models. Storage capacity has been boosted to over 5 Terabytes. Modular design allows you to upgrade existing VAX 6000 systems to these new performance levels without the same system cost. (We also reduced the price of the VAX 6000



Model 310 and VAX 6000 Model 400 systems by 23 to 30 percent. This marks a major price/performance gain for two of our most popular and successful VAX products.)

#### MicroVAX 3100 Systems

We boosted the performance of our MicroVAX 3100 with two new models—the Model 100 and Model 200.

Both offer you 45 percent more performance, with no price increase over the previous models. These new MicroVAX systems now can support up to 40 users for the price of a PC.

#### VAXstation 3100 System

In our VAXstation family we announced the new VAXstation 3100 Model 76, which almost doubles the performance of the previous top-of-the-line VAXstation 3100 Model 36/46.

**Here is some news  
you can use on Digital  
storage products and programs:**

**KDM70 XMI Controller Does It All**

The KDM70 XMI storage controller is Digital's most powerful single-host controller. It provides Digital Storage Architecture (DSA) devices with high-speed access to XMI-based VAX 6000 client/server systems and VAX 9000 production systems. The KDM70 underscores the benefits of DSA by providing the latest advanced technology supported by the entire range of RA series disk drives and TA series tape drives.

Powered by an on-board CVAX microprocessor, the KDM70 controller features two data channels and eight ports, with the capability of simultaneously supporting a mix of disks and tapes. The two channels are dynamically allocated to the eight ports for optimum I/O performance, making the KDM70 the only DSA controller that allows devices to operate in parallel at the maximum speed of the controller. The KDM70 can service up to 1,200 I/O requests per second and sustain data rates of 34 MB per second to support two spinning RA92 disks, and 4.0 MB per second for two ESE20 disks. This also makes the KDM70 our fastest and most versatile single-host controller.

**Comparison Notes on the KDM70**  
When compared to the KDB50/BI-based controller, the KDM70 is approximately three times more expensive, but provides twice as many ports, delivers almost six times more performance, and connects directly to the XMI bus.

When compared to the HSC40/C-based storage server, the KDM70 is approximately one-third the price, requires no additional floor space, provides 25-percent fewer ports, and delivers similar performance while reducing I/O traffic on the CI bus.

**Fastest Disk Just Got Faster**

Our fastest solid state disk, the ESE20, now provides up to 1,200 I/O requests-per-second throughput when used with the KDM70 disk controller. Quadrupling the current ESE20 solid state disk performance, the device-level access time decreased from 1.3 ms to near zero. The increased speed of the ESE20 balances the increased processing speeds of the VAX 6000 and VAX 9000.



**New RA Disk for All Storage Arrays**

The new RA92 disk drive provides a 25 percent increase in capacity and 10 percent higher performance over the RA90—at a lower price per megabyte.

It is featured in the SA800 and SA850 storage arrays, and it is also supported in all existing SA600, SA650, and 40-inch RA90 cabinets. It plugs right into current HSCs and other DSA/SDI controllers without interrupting system operations and without needing to change either system or application software.

The RA92 allows the SA800 storage array to configure up to 12 GB of usable storage in 5.5 square feet of floor space. Capacity isn't the only metric by which the RA92 excels. With a 16 ms average seek time, and a transfer rate of up to 2.8 MB per second, the RA92 is a high-end disk that ranks with industry leaders.

**News on Tape**

At \$1,800, Digital's new 525 MB TZK10 quarter-inch cartridge (QIC) tape drive offers leadership price, capacity, and performance in low-cost back-up. This industry-standard QIC drive is designed to provide unattended back-up for entry-level systems, and it's available now to support the new DECsystem 5100 systems.

Complementing the new TZK10 tape drive is the 1.2 GB TLZ04 tape drive. Now available across a wide range of ULTRIX and VMS-based systems and servers, the TLZ04 drive's formatted transfer rate of 170 KB per second can complete back-up of a gigabyte of data in less than 2 1/2 hours.



**RABX Migration Program: Save More, Worry Less**

The popular RABX Migration Program has been enhanced to include the latest storage products. If you have RAB0, RAB1, RAB2, or SA482 series disk drives, you can now significantly reduce operating costs by upgrading to the newer RA92, SA70-JK (RA70 4-pack), SA800, or SA850.

Substantial savings begin "up-front" through the use of generous allowances on your existing RABX series drives. You can receive \$6,000 for either one RA82 or two RAB1/RA80 drives toward one of the new RA92, SA800, or SA850 storage configurations. There's no limit on the number of trade-ins. You could, for instance, trade in 16 RA82 or 32 RAB1 drives for a new SA800-LA, and receive a hefty \$96,000 allowance towards the purchase—all after applying your DBA (Digital Business Agreement) discount.

In addition to these generous allowances, you will realize substantial long-term savings in floor space utilization, power consumption, HSC ports, and maintenance charges.

Additional program features include comprehensive migration planning services, de-installation and removal of the old equipment, installation of new equipment, and installation of any related storage products that are purchased at the same time—all at no extra charge.

Trade-in values are subject to periodic updates, so call your Digital sales representative for more details, or call our Technical Consulting Center at 800-343-4040 and reference the RABX Migration Program.

Remember you can use our fast, easy, direct connections for ordering and information on these and other Digital storage products and services. Call 800-DIGITAL (800-344-4825), or log in to The Electronic Store (800-234-1998 at 1200/2400 baud).

# EXECUTIVE REPORT

## THE STAFFING OUTLOOK FOR IS

### The rising value of versatility

BY ALAN RADDING

**P**atricia Gilmore believes in being ready for any situation. "My sin has always been to have a staff that can program on anything for anything," she says. That philosophy has been put to the test in recent months at Coleman Co., where Gilmore is director of MIS. Making do with less has become a way of life at the Wichita, Kan.-based sporting goods manufacturer since a leveraged buyout led to across-the-board staff reductions, including a 59% cut in the information systems staff.

The reductions came at a critical time for the IS department, Gilmore says. The company is on the verge of a major shift to personal computers and PC networks — a move that's in the budget for 1991.

Because she can't count on adding staff or even acquiring new tools during this period of extreme belt-tightening, Gilmore is depending on her existing staff to perform in a dramatically changed working environment. "Everyone's job is changing a lot," she says. "There will be fewer people in IS operations and more PC support and LAN support." Programmers who previously worked on the mainframe systems will now be doing PC applications, too.

Gilmore says she is confident that her remaining staff will rise to these challenges, chiefly because adaptability has always been one of her main hiring criteria. She has made a point, she says, of seeking people with a strong grasp of systems methodologies and changing technologies, steering clear of specialists and, instead, hiring graduates from four-year, degree-granting computer science programs.

Coleman's situation is far from the exception. Companies everywhere are either tightening their belts or trying to get



Coleman's Gilmore hires on the basis of adaptability

into condition in case that need arises. The impact of this new emphasis on trimmed-down fitness is being felt in IS, as it is in every other department. At the same time, new technologies are pushing both high-level computing and IS staffs deeper into business areas.

As a result of these dual pressures, U.S. business and the IS function are both going through periods of transition. Unfortunately, it is easier to distinguish what is being left behind than where these trends are all heading.

It is an oversimplification to say IS is changing from the centralized mainframe to distributed PCs and that staff members should prepare to shift their skills and focus accordingly. "In some companies, that is happening, but not everywhere. There

is no one answer," says Steve Joffe, vice president at Paramus, N.J.-based Source EDP.

At Spalding Worldwide Sports in Chicopee, Mass., a number of changes are already under way. The focus of development is shifting away from Cobol, says Bard White, Spalding's director of MIS. Instead, the company is "bringing in more commercial packages and doing more client/server stuff on a PC."

Everyone on the systems staff is required to learn PCs, DOS and PC packages, he says, and telecommunications and networking skills are in heavier demand than ever before.

But these changes don't mean that traditional mainframe-oriented Cobol programmers are going to find themselves suddenly stuck with obsolete skills. Up-

keep of existing Cobol code will provide work for a long time to come. Furthermore, there are many large companies that are far from ready to make a wholesale switch.

Burlington Industries in Greensboro, N.C., isn't ready for a big move, even though the company is moving toward a more diversified mixture of platforms.

"We need to go from the PC to the midrange to the mainframe. Networking, particularly local-area networking, is growing in importance," says E. Ritchie Fishburne, director of corporate IS. That's only part of the picture, however. "We also have 20-plus years of programming in place and need people to maintain those systems," Fishburne says.

#### Adaptability an asset

At many places, the major change will be that, like Gilmore, IS managers will soon place more emphasis on adaptability as a job qualification. According to Thomas Lodahl, chairman of Cognitech Services Corp., an Easton, Conn., consulting firm that deals with IS-related human resources issues, Cobol programmers of the future will need to know computer-aided software engineering, C, C++, object-oriented programming and Unix, and they will have to deal with core systems in which network hooks are as important as the basic code.

Even companies that are moving in the direction of mainframes for the first time aren't planning to settle for plain vanilla mainframe programming skills.

Highland Superstores, Inc., a 100-store consumer electronics chain based in Plymouth, Mich., is converting from an IBM System/38 to a mainframe to accommodate its rapid growth. Highland is seeking programmers who understand DB2 and SQL and are capable of functioning as business analysts, says George Bauck, vice president of distribution, warehousing and IS.

It is not just the hiring  
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#### INSIDE

### Harnessing team power

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### Observations of an occasional employee

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Radding is a type-beat writer based in Newton, Mass.

# IBM lets the Now 486 technology

Without the proper venue, dazzling ability often falls short of expectations. That's certainly been the case with the Intel 486™ microprocessor, a processor that hasn't been utilized to its full potential. So that's what IBM set out to do. Just as it takes a seasoned jockey to turn a thoroughbred into a champion, it took IBM to give the 486 processor every opportunity to work its genius. Introducing IBM Personal System/2® Model 90 XP 486 and Model 95 XP 486.

From speed and storage capacity to graphics capabilities and upgradability, the new PS/2® Models 90 and 95 are designed to optimize the power of the Intel 486 processor and deliver a truly balanced performance—equipping you with solutions for today, and providing a platform of growth for tomorrow.

## THE 90'S ARE A POWERFUL BREED

Right out of the starting gate, the Models 90 and 95 will astound you with their power and sophistication. Featuring a 33 MHz processor and a 25 MHz processor that's easily upgraded to 33 MHz, they deliver blazing speed and balanced performance, expanding your capacity for computer-intensive applications like CAD/CAM, financial modeling and multimedia. The course between your data and your processing has also been strengthened—the Micro Channel™ 32-bit data path, combined with a lightning-quick data-transfer rate, not only optimizes the present power of the 486 processor by feeding it a steady stream of information, but also provides for processor

enhancements and will allow you to benefit from advanced operating systems to come. Plus these other innovations: a wider 64-bit data path which optimizes the 486 processor's access to system memory; 4MB memory standard

(expandable to 32MB); and a 256KB cache option for even greater speed. All in all, it's easy to see how the concept of computer "power" has been enhanced, and how IBM helps you take full advantage of every second of computing time.



## BRILLIANCE ON DISPLAY

With increased power comes increased capabilities—the most visually stunning of which is Extended Graphics Array (XGA), standard on the PS/2 Models 90 and 95, and the heart of IBM's spectacular new display presentation.

With high resolution (1,024 x 768 pels) and execution that's significantly faster than VGA, XGA's sharper, clearer picture, coupled with the IBM 8515 color display, gives you swifter performance in windowed environments and provides graphics-intensive applications such as desktop

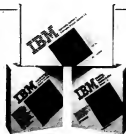


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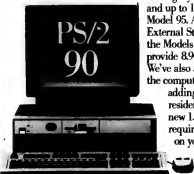
publishing, image processing and engineering design with a stunning new look.

## FAST TIMES ARE IN STORE.

To satisfy even the most demanding storage needs, from LAN systems to data base management to numeric-intensive applications like financial analysis and modeling, IBM has one of the most advanced solutions available. IBM's super-fast SCSI hard disks are pure state-of-the-art performers. With additional hardfile expansion bays, the PS/2 Models 90 and 95 have enormous storage potential—up to



96 Gigabytes on the Model 90 and up to 1.6GB on the Model 95. And with the PS/2 External Storage Enclosures, the Models 90 and 95 can provide 8.96GB and more. We've also augmented the computing power by adding more flexibility to resident memory—our new 1.3 version of OS/2® requires as little as 2MB on your system. With this streamlined



version you not only get more room for applications, but some users will experience a substantial performance increase in system functions as well. So when you need to make great strides with your computing power, you can count on IBM to give you terrific storage capability wherever you may need it.

## DESIGNED TO KEEP YOU OUT IN FRONT.

For the turns and hurdles ahead, you'll need technology that has foresight built in. Through a unique design, the Expandable Processor (XP) allows for an architected family of upgradable processor enhancements that can extend the life

Features	IBM PS/2 Model 90	IBM PS/2 Model 95
Microprocessor Standard Clock speed <sup>1</sup> Optional upgrade	80486 25-33 MHz 33 MHz	80486 25-33 MHz 33 MHz
Memory Standard Maximum	4MB (70ns) 32MB	4MB (70ns) 32MB
Integrated Functions	Extended Graphics Array (EGA) and display port, dual DMA serial ports, DMA parallel port, pointing device port, keyboard port, diskette controller support for three drives, SCSI adapter with Cache.	
Fixed Disk Storage Standard	80-320MB	160MB-320MB
Display Modes APA Modes	XGA (includes all VGA modes) 640 x 480 x 256 colors/ 64 gray shades, 1024 x 768 x 16 colors/gray shades; hardware support for 132 column text mode, 16-bit direct color mode at 640 x 480 x 64K colors	
Available Expansion Slots	three 32-bit	six 32-bit
Bus Architecture Data path	MCA 32-bit	MCA 32-bit

of your system. With Micro Channel busmaster adapters, you can incorporate multiple processors—like adding "computers" to your computer. And coupled with the industry-standard Small Computer System Interface (SCSI), you'll be able to support new applications and continue to build on your system as your needs become more varied and complex.

With optimized performance in balance, power, speed and adaptability, the new PS/2 Models 90 and 95 are designed to keep you ahead of the pack. To find out more about the new leader in 486 computing, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.



How're you  
going to do it?  
PS/2 it!

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expectations that are changing: so are the settings in which IS staff members can expect to work. Although head counts in many central IS departments are flat or shrinking, overall demand for IS professionals is not diminishing as much as those figures and all the talk about user programming would indicate.

Instead, IS staffs only seem to be getting smaller because IS professionals are being drawn into business areas.

"LANs and PCs are pushing IS professionals into the user groups," Joffe says. Furthermore, many consultants and recruiters say that when these systems professionals become enmeshed in business areas, they may become harder to identify because of title shifts that de-emphasize their technical orientation and emphasize their support function.

A systems analyst assigned to a marketing department may, for example, wind up carrying a business card that says "marketing analyst."

And that's not even the farthest reach of the integration trend. J. Daniel Cooger, professor of IS and management science at the University of Colorado in Colorado Springs, says many IS professionals are being hired directly into business departments. More than half of Cooger's last graduating class took that route, he says.

It is true that some users are beginning to perform functions that used to belong to IS professionals, but most observers say

this is a case of cooperation, not replacement.

If you are concerned about efficiency, it makes no sense to have users operating on their own, Buick says. "It's true, he adds, that "if you have an amateur user, he can use SQL to query the database on his own." The question is whether you really want him to. Buick says he thinks about "It sucks up cycles if you let the users run amok." Instead, Highland channels requests through its IS analysts, who use the same advanced tools to "knock out the requests four to five times faster," he reports.

The increase in educated requests from users who could do for themselves is a pinch in the demand is expanding so rapidly for technically skilled analysts. By the end of the century, this job category will be growing at a faster annual rate (72%) than that of programmers (60%), in part because of the broader scope of the analyst function, says Brenda Walcott, an economist at the U.S. Bureau of Labor Statistics.

These projections represent the continuation of a trend that has already begun, says Richard Wender, national director at the IS Division of Robert Half International, Inc. in Menlo Park, Calif. — "a collapsing of functions, with more programmer/analysts than pure programmers or pure analysts."

This pure blend of programmer/analyst, Wender says, will write code where necessary, do

systems analysis and write documentation, aided by new tools that accommodate this combination of jobs.

Wender is most worried about the pure coder who has no experience with or interest in higher-level languages or business issues. "The ones who should be most concerned are Cobol programmers without any business skills," he says.

Joffe, however, says that the person who should be most concerned is the nontechnical analyst — one who does not have programming skills at any level. For individuals of this type, he says, the handwriting is on the wall: "He'd better become technical or become a user."

IS shops are already looking for interdisciplinary types. "I need someone who is not afraid to code but is also not afraid of analysis," says Steve Crasner, manager of systems development at Kendall Healthcare Products Co. in Mansfield, Mass. Crasner can usually find one or the other, he says, but the combination is hard to come by.

"Technical skills are a given. We expect people to be state of the art and to maintain that level," says Donna McNamara, director of human resources at the Corp. Technology Group of College-Palmolive Co. in Piscataway, N.J.

It's what can be layered on top of those technical skills that really makes the difference, says McNamara — things such as the ability to listen to clients, understand their needs and communicate with them; the ability to think like a businessperson; and the ability to work as part of a team that includes business and financial people as well as systems professionals.

#### Personal skills a plus

Other IS directors echo McNamara's insistence on a combination of technical and business/personal skills. Their message is clear: Neither skill set is enough by itself anymore.

"The IS person must understand the business and then know where to get the technology to solve the problem," says Christina Kucharszyn, manager of IS staffing at Glenview, Ill.-based Kraft General Foods, Inc. She warns prospective IS staff members at Kraft to be prepared to spend as much as 95% of their time working with users.

To find these people, many firms are paying a premium — at least for certain skill combinations — despite corporatewide efforts to keep costs down.

Gilmore has found it imperative to "hang onto key people," despite the intense pressure to cut costs. As a result, she has been "fairly generous with salary increases," even as she moves people into the end-user PC networking environment.

At Spalding, White pays a premium for the combination of

## Hot technologies

Staffing consultants see a growing demand for personnel grounded in a number of new technologies. The following are among the most desirable competencies:

• **CASE and fourth-generation languages.** Programmers and analysts who know these tools are finding that they can command a premium, particularly in IBM midrange and mainframe environments.

• **Unix and open systems.** Consultants say most of the activity in this area is currently at the departmental level. Unix programmers, however, are in short supply and get top dollar.

• **Personal computer applications developments.** IS staffs are regaining influence over PC applications development. Some shops are moving applications development to PC platforms. DOS and OS/2 skills are in demand, but PC-only experience does not pay as well as PC skills combined with more conventional IS skills. Experience with Microsoft Corp.'s Windows and Presentation Manager in programming environments pays much better than standard PC development.

• **Networking.** While IS shops are paying increased attention to networking, most of the work and the best salaries are going to networking and telecommunications specialists with DB2, Oracle Systems Corp.'s Oracle, Ingres Corp.'s Ingres, Sybase, Inc.'s Sybase and other relational databases in is short supply and will attract excellent compensation.

• **Client/server.** Almost any experience with client/server architecture will bid up the salary offers.



technical skills and business knowledge. But, he adds, "the closer you get to the end user — the pure PC person — the softer the salaries get."

If the IS staff is increasingly involved with the user, then who does the routine or specialized work of IS? Often, the departments are turning to outsiders — independent contractors who come either with a highly specialized skill or as a general

half of their independent contractors. "We hold the [permanent] head count at 100, because that's the appropriate long-term level," he notes.

"The real value of consultants is when you're doing a conversion. Otherwise, we prefer permanent staff," Crasner says. Kendall went through a major conversion to IBM Application System/400s and has used contractors extensively but has since minimized the use of outsiders.

Even Alan Bugh, vice president of MIS at Wilson Sporting Goods Co. in River Grove, Ill., brings in contractors for some projects, although he doesn't like using them. "These are not very exciting projects — things like IMS-to-DB2 conversions," he explains.

"If the project is going to last, say, six months, then I'll hire, but it's just for three or four months, then I'll use a contractor," Fishburne notes.

Despite the dim economic outlook, corporate imperatives to reduce expenses and the increasing use of programmer productivity tools, growth in IS staffs is inevitable, because demand for information continues to skyrocket.

There continues to be growth because there is such a demand for more and more projects. We move much as much progress as we'd like to," says Garland Gunter, director of MIS at Cincinnati-based Lenscrafters, Inc. ■

## Bend and stretch

In an effort to attract and keep good people, some information systems departments are starting to consider more flexible work arrangements (see story page 84).

"A lot of IS lends itself to nontraditional work arrangements," says Gil Gordon, a Massachusetts Junction, N.J., consultant specializing in IS staffing issues.

Spalding Worldwide Sports is flexible about when people put in their hours, says MIS director Bard White, and some IS staff members work from home using remote terminals. The only stipulation, he says, is that arrangements be made in advance.

George Buick, vice president of distribution, warehousing and IS at Highland Supercenters, Inc., says he is happy to provide flex time, although Highland itself does not endorse it. "It is necessary in IS," Buick says, to relieve traffic pressure on a computer that "is busy from 9 to 5." Job sharing is a more difficult situation, he says, although "IS jobs can often be broken into small pieces and done by part-timers."

George DiNardo, executive vice president at Melton Bank Corp., says he "tries anything to attract good people and boost productivity." "Telephone, flex time, home — anything that relieves pressure on the CPU, I'm happy." Job sharing? "Sure, that gets me about 2 1/2 times the output out of two people."

There are limits to how much flexibility can be built into IS jobs. Alternative work schedules can, for example, conflict with the need to increase interaction with users and can represent a headache for managers trying to juggle schedules. For the most part, however, only a small part of the eligible staff will avail themselves of such arrangements. On Melton's IS staff, about 5% participate.



# Player-managed teams score very well

BY SHERYL KAY

The self-managed team is being hailed as the latest and greatest idea in management theory and the possible key to the U.S.' productivity conundrum. Although it is hardly likely that a concept could live up to that billing, many companies across the country that have experimented with letting groups of employees manage themselves say the results are impressive. For the most part, these experiments have taken place in manufacturing settings. Some people, however, believe this is an idea that is tailor-made for information systems organizations.

"The way self-managed teams operate is that a group of four to 15 employees is given the authority to set their own work schedules, target strategies, disciplinary procedures and other processes. These groups may be permanent or formed for the duration of a specific product. They may be culled from one department or represent a cross-functional mix. In place of a manager, the team adviser usually

serves as a resource individual.

There are many opportunities to apply this concept to the IS department, says Kathryn J. Hayley, senior manager at Deloitte & Touche in Chicago. The more managers you have on your IS teams, she says,

the more time you'll spend on administrative activities that only serve to "burn time and money."

Harvey Shrednick, vice president of information services at Corning, Inc. in Corning, N.Y., reached a similar conclusion two years ago when the company's operations manager accepted a new position at another division of Corning. "It gave us the impetus to say, 'Why bother refilling the job?'" Shrednick says.

Today, the computer operations area at Corning functions as a fully self-managed team. "They develop their own training requirements, schedule their own shifts, do their own personnel reviews and award merit increases," Shrednick says.

Since the change, the quality of work has improved, Shrednick says. Systems availability is up, and the cost of running the department is down. In fact, the benefits of the team approach have become so apparent that Shrednick has started similar groups in several other areas, including customer service, the computer utility business team and administrative systems. By January 1991, technical services will also be self-managed.

At Hyatt Corp. in Chicago, autonomous work groups have a shorter history, but results have been equally promising. Gordon Kerr, vice president of MIS, initially moved to this management method as a matter of necessity. He had two groups of applications developers at work on two important projects. What he didn't have, he says, were the "available personnel or the time to attempt the traditional management approach."

Although born of scarcity, the ap-

proach paid off handsomely, according to Kerr. Not only were projects completed on time, he says, but there was also "a shared learning experience and a sense of ownership about the projects."

At Chaparral Steel in Midlothian, Texas, a company cited as an example of productive manufacturing by MIT's Commission on Industrial Productivity in 1989, IS staff members work on self-managed teams as part of larger cross-disciplinary efforts. Dave Fournie, who oversees a portion of the IS department as part of his responsibilities as general manager of operations, points to an inventory group,

which is broken down into three self-directed subteams: quality assurance, production trackers and software designers and developers.

According to Fournie, the combined efforts of these teams have streamlined inventory procedures, giving Chaparral a strong competitive advantage.

Of course, self-managed teams don't work in all situations. Certain IS groups may not function well in the self-directed work model. Some people want to be told what to do, Fournie says. "When you give them full authority, they back off and say, 'You're going to help us, aren't you?'"

There are other inhibitors as well. Hayley says that if the IS team does not have a well-defined task, a solid set of technical skills, sound business judgment and members who can be trusted and know when to seek help, then the self-directed style should not be considered.

Frank Opperman, logistics manager at the Tape Manufacturing Division of 3M Co. in Freehold, N.J., says he probably wouldn't try it. Although such teams are already operating in many parts of 3M, Opperman doesn't think the idea would work in IS, which has to respond rapidly to changing business requirements. ■

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.



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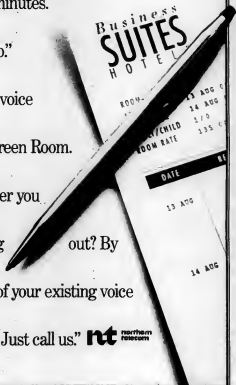
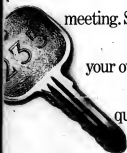
message. Message one: "John, we're in the Green Room.

See you there at 8:30. Oh, and that fax number you

need is 555-4473." **8:00 A.M.** "Checking out? By

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## What's the matter today with information systems staffs?

### FIRST PERSON

BY LOUIS SCHANER



After more than 20 years of alternating between full-time and contract employment as a programmer/analyst, I am convinced of two things. One is that, although information systems personnel can be diffi-

cult to manage, they are not nearly as self-centered and lacking in loyalty as is usually portrayed. The other is that this misconception stems largely from the fact that IS departments are usually so badly managed that the companies that house them.

Problems in IS staffing and staff management are symptomatic of a macro problem plaguing the entire country. We are a country of mature organizations whose energies are mostly spent in keep-

ing the bureaucratic machinery oiled and running.

Synergy and individual contributions are subordinated to maintenance, and employees are measured by how well they fit and perform within the confines of the machine.

#### Older not always better

If a new cog doesn't fit properly or makes too much noise, we try greasing it, then modifying it. If neither of these actions work, we end up replacing the cog with a new one.

What that ignores, of course, is the probability that the new cog is the best component of the machine and that a far better course would be to consider replacing the surrounding worn-out parts that

can't perform up to the standards of the new one.

Most IS departments don't acknowledge that this is the way they operate—but it is. When they advertise for employees, they emphasize the opportunities, the technologies they have invested in, the training that is available and the strategic direction.

Then, as often as not, they try to turn the database administrator they have hired into a programmer developing in Cobol on a personal computer. The exciting tools that were mentioned in the interview turn out to be off-limits, because the company isn't really interested in exploiting the technology right now. The training programs are often very real but serve only to help disgruntled professionals build their portfolio of skills for the next job interview, because there is nowhere to apply the learning in their present jobs.

Of course, there is a reasonable explanation for much of this: Faced with a growing shortage of highly skilled professionals, IS managers often hire the best people they can find, with the hope of eventually finding the ideal slot for them—one that will make use of their skills and knowledge of advancing technologies. Unfortunately, by the time the right job materializes, the person has usually left.

Less easy to explain is the unwillingness of many organizations to listen to ideas or explanations of reality from staff members. I've seen developers come up with estimates for projects using a company's approved methodology, only to be told that the job will have to be done for a third of the cost in a fraction of the necessary time. I've also seen plans rejected or ignored when advanced by staff members and then subsequently embraced when put forth—without substantial change—by an outside consultant. In fact, I've been on both sides of that particular fence.

#### Contributing factors

Many of these problems result from bad management practices that permeate the whole company, not just the IS department. Furthermore, IS departments are often hobbled by policies over which they have no control.

One major example is human resources guidelines that allow the hiring of a new employee at a substantial increase but prevent giving the same amount as a raise to a current staff member who has acquired enough new skills to justify the raise but has not accumulated what is considered to be enough time in his current position.

More aggressive compensation and more flexible management could help to stem turnover considerably and build more stable and productive IS staffs.

What could help even more, however, is commitment to the principles, philosophies and methodologies put forth by any of the gurus of total quality management. A company or IS department that truly builds its culture around those ideas won't have to depend on consultants for constructive ideas. The employees will come up with plenty of ideas on their own—and will stick around to see them implemented. ■

Schaner operates a consulting company based in Maitland Beach, Fla. He has worked in the information systems field for 23 years, spending roughly equal parts of that time as IS employee and consultant.

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"We like the openness of methodology we get with KnowledgeWare tools. The tools let us develop a methodology that fits the experience of our people. When the methodology fits the people who use it, it's a lot easier to get them to buy into it."

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*IS Division of Manufacturing Conglomerate*

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# IN DEPTH

## Preparing for AD/Cycle

*Even though the real products are a ways off,  
it's not too early to start the long climb*

BY SAMUEL B. HOLCMAN

**C**onsidering all the AD/Cycle component tools, the application development platform and the new development methodology needed to use them successfully, IBM's AD/Cycle represents one of the biggest changes in the history of systems development.

AD/Cycle will affect everyone involved with software development. No employees will continue to perform their jobs as they do today if they take advantage of AD/Cycle.

The magnitude and importance of this change demand that systems development organizations understand and manage the cultural and organizational changes that will take place.

Despite the fact that many AD/Cycle components are not yet available, the organizations that will gain the greatest competitive advantage from AD/Cycle have already begun to make preparations and are implementing their plans. There are many implementation activities that can — and must — be started today.

### Who will take charge?

Unfortunately, being a "change leader" is not part of anyone's job description.

Few people responsible for implementing AD/Cycle have considered the organizational changes that face them. Even fewer have taken steps to ensure that the change process is managed effectively.

Considering the cultural and organizational difficulties that

many development organizations have had in implementing individual computer-aided software engineering tools, inadequate attention given to the AD/Cycle change process is guaranteed to cause the implementation to fail.

However, even more cultural

understanding how prepared an organization is to introduce AD/Cycle.

In their book *Changing Ways*, Murray Dalsiel and Stephen Schoonover identify four attributes to consider when assessing how prepared an organization is for the

transition to their success.

2) **Clarity of expectations.** Each organization affected by the introduction of AD/Cycle must clearly understand its role in the change process.

Misestimated or misunderstood expectations have caused otherwise successful productivity tools and techniques to fail within a software development organization.

3) **Amount of top management support.** Support for AD/Cycle throughout the organization is a critical factor. Those who are most affected by AD/Cycle should play a major role in identifying the benefits to the software development process and the most effective methods of introduction. The size and expense of introducing AD/Cycle certainly require top management's support.

However, it is important for this support to be sustained throughout the various implementation activities and for it to be clearly visible to those who are affected by AD/Cycle.

4) **Compatibility with organizational goals.** Of course, top management's commitment to introducing AD/Cycle must also be consistent with other policies and directions being established by top management that affect system development practices.

As AD/Cycle implementation plans are developed, the impact of cultural and organizational change should constantly be considered.

Implementation plans should include activities that guide the change process so that change can be used as an asset rather than a liability.

Dalsiel and Schoonover also identify five critical factors to consider when planning change. These five factors can be applied



al and organizational changes will follow as the system development community begins to implement AD/Cycle. It's clear that managing organizational change is a critical success factor in implementing AD/Cycle.

An important first step for every development organization to perform is a self-assessment. This is needed to evaluate and

needed change:

1) **History of change.** Historical results are a good indication of how ready a development organization is for the introduction of AD/Cycle.

It is important to understand how well previous implementations of new software development tools and techniques have succeeded and what factors con-

• **Organizational changes are key**

• **Long- and short-term plans needed**

• **The time to start is now**

Holcman is president of Computer & Engineering Consultants Ltd. in Southfield, Mich.

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to AD/Cycle implementation:

1) **Clarifying plans.** AD/Cycle implementation plans and benefits should be defined and conveyed to everyone affected by the new systems development environment. This includes clearly identifying the changes that are required by all levels of the organization.

2) **Integrating new practices.** Time should be taken to learn how the AD/Cycle tools and methodology will be incorporated into the existing systems development environment.

Everyone involved in the software development process should clearly understand when to utilize the new AD/Cycle components and when possibly to continue to utilize previous development practices.

**E**STABLISHING A SENSE of ownership will lead to greater acceptance and more effective use of AD/Cycle.

3) **Providing education.** AD/Cycle requires many people to learn new roles and take on new responsibilities within the software development process. Education and support need to be provided to these individuals so that they can learn to effectively utilize AD/Cycle components and processes.

4) **Fostering ownership.** A continual effort must be made to avoid "imposing" AD/Cycle on software development organizations.

Establishing a sense of ownership will lead to greater acceptance and more effective use of AD/Cycle. Individuals who are affected by AD/Cycle should have key participation roles in the planning and implementation of AD/Cycle activities.

5) **Giving and getting feedback.** AD/Cycle implementation objectives should be defined and monitored during all introduction activities. The effectiveness of implementation activities should be used as feedback to modify and improve AD/Cycle implementation plans.

The justification for AD/Cycle is another key aspect that has to be addressed

## AD/Cycle in six steps

**S**oftware visionary Ed Yourdon has identified six changes required by software development organizations that introduce IBM's AD/Cycle:

1) An organizational commitment to use a common, standard set of development tools and methodologies rather than every software engineer and/or project team using a private set.

2) An organizational commitment to use a code generator and/or application generator and get out of the business of handwritten code.

3) The use of a common repository to store all information about all systems in the organization and the decision to treat this information as a major corporate asset.

4) A shift in emphasis away from superfluous production of mediocre systems to a new emphasis on high-quality systems that are responsive to user needs.

5) A corporate commitment to capture metrics on all aspects of systems development and maintenance.

6) A decision to use an active approach to software reusability at the beginning of projects.

SAMUEL B. HOLTMAN

during the preparation activities. Steps need to be incorporated into the implementation plans that measure and document the benefits of AD/Cycle.

### First things first

Before that, however, software development organizations must understand and document how well they perform software development activities today.

By understanding which software development steps are performed well and which need improvement, AD/Cycle

## Short-term strategies

Your short-term plan for implementing AD/Cycle should identify steps that can be performed during the coming year.

These will get you started and help your organization achieve some of the longer range benefits.

1) **Assess current capabilities.** Establish AD/Cycle project team. Review current applications development approach.

Assess current tools. Identify current skills. Assess organizational readiness.

2) **Establish methodology.** Talk to others. Identify alternatives. Develop methodology. Document methodology. Prepare education materials.

3) **Select initial AD/Cycle components.** Establish tool requirements.

Evaluate and select AD/Cycle tools. Identify education and support.

Complete justification process. Acquire and install AD/Cycle tools.

4) **Initiate education plan.** Identify skill requirements. Evaluate education sources. Develop initial education plan.

Begin education program.

5) **Establish measurement program.** Select metrics.

Establish measurement procedures. Measure current quality and productivity levels.

6) **Conduct pilot projects.** Identify and select projects. Prepare project plans.

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Document project results. SAMUEL B. HOLTMAN



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**DEPT/OF MANAGEMENT**  
 18. Chief Information Officer/Vice President/Asst. VP  
 19. Manager/Supervisor  
 20. Director/Manager/Information Center  
 21. Director/Manager/Systems Development  
 22. Director/Manager/Systems Architecture  
 23. Director/Manager/Systems Programming  
 24. Director/Manager/Systems Maintenance  
 25. Director/Manager/Systems Security  
 26. Director/Manager/Systems Training  
 27. Director/Manager/Systems Testing  
 28. Director/Manager/Systems Support  
 29. Director/Manager/Systems Administration  
 30. Director/Manager/Systems Management  
 31. Director/Manager/Systems Development  
 32. Director/Manager/Systems Architecture  
 33. Director/Manager/Systems Programming  
 34. Director/Manager/Systems Maintenance  
 35. Director/Manager/Systems Security  
 36. Director/Manager/Systems Training  
 37. Director/Manager/Systems Testing  
 38. Director/Manager/Systems Support  
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 95. Director/Manager/Systems Security  
 96. Director/Manager/Systems Training  
 97. Director/Manager/Systems Testing  
 98. Director/Manager/Systems Support  
 99. Director/Manager/Systems Administration  
 100. Director/Manager/Systems Management

3. **COMPUTER INVOLVEMENT** (Circle all that apply)  
 Types of equipment with which you are personally involved either as a user, vendor or consultant:  
 A. Mainframe/Supersystems  
 B. Microcomputer/Small Business Computers  
 C. Communications Systems  
 D. Local Area Networks  
 E. No Computer Involvement

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implementation activities can be prioritized by need.

Furthermore, if the effectiveness levels of current development practices are measured and quantified, these measures can be used to determine the improvements, benefits and justification associated with implementing AD/Cycle.

Because one of the primary motivations in introducing AD/Cycle is to improve software development productivity and quality, we need to understand the productivity and quality levels currently being achieved by the development organization.

Software guru Ed Yourdon has written: "It makes no sense to bring in expensive tools to improve productivity if you don't know your current productivity level."

**S**UPPORT FOR AD/CYCLE throughout the organization is a critical factor. Those who are most affected by AD/Cycle should play a major role in identifying the benefits to the software development process and the most effective methods of introduction.

el. Why bother trying to increase quality if you don't know your system's current quality level and you have no agreed-upon way of measuring quality?"

Software development organizations should measure current productivity and quality levels before they introduce AD/Cycle.

To accomplish this, a short-term strategy

can be identified and executed to prepare development organizations for AD/Cycle (see story page 72).

AD/Cycle provides the software development community with great potential for increased productivity and quality improvement.

However, this improvement will be realized only by those organizations that

prepare themselves wisely. The good news is that many of the AD/Cycle tools are not yet available, allowing software development organizations time to get ready.

With the tremendous impact AD/Cycle will have on software development in the '90s, failing to prepare will be equivalent to preparing to fail. •

## Long-term strategies

As additional AD/Cycle components become available, you'll need to develop a longer range strategy.

This plan will identify the remaining steps needed to integrate future AD/Cycle components into a comprehensive environment that can support software development, implementation and maintenance activities.

1) **Review short-term results**  
Consolidate project results  
Document quality and productivity improvements  
Identify remaining areas for improvement

Develop continuing introduction recommendation  
Review management support

2) **Complete methodology introduction**  
Review project feedback  
Revise methodology  
Update documentation

Revise education materials  
Establish ongoing feedback and improvement process  
3) **Select additional AD/Cycle components**  
Update tool requirements  
Evaluate and select additional AD/Cycle tools

Identify education and support  
Develop integration plan  
Complete justification process  
Acquire and install AD/Cycle tools

4) **Complete education program**  
Review/revise skill requirements  
Evaluate education effectiveness  
Update education plan

Complete education program  
5) **Deploy measurement program**  
Begin ongoing measurement program  
Identify quality and productivity improvement opportunities

Establish quality and productivity goals  
Integrate measurement reporting into planning processes  
6) **Establish support functions**  
Review project support skills and effectiveness

Identify support organizations:  
- Methodology  
- Data administration  
- Process administration  
- AD/Cycle components  
- Training  
- Measurement

Develop personnel recommendations  
SAMUEL R. HOLCMAN

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# COMPUTER INDUSTRY

## NATIONAL BRIEFS

### Future present

Scotts Valley, Calif.-based compact disc/read-only memory systems provider **Meridian Data, Inc.** earlier this month extended a seat on its board to former **Apple Computer, Inc.** executive Jean-Louis Gasee. Meridian President Fred Meyer said the firm hopes to leverage Gasee's experience in the computer industry as the CD/multi-media and commercial computer worlds converge. Meanwhile, back at Apple, a spate of executive announcements added up to a vote of confidence in **Michael Spindler**, nearing his first anniversary as president. Included: a board seat for Spindler.

### Switching

After some 20 years in private data communications networks, Cambridge, Mass.-based **BBN Communications** is reaching to cut itself a heartier slice of the networking market. The firm said that over the next two years it will vault its traditional packet-switching and inter-networking capability into broadband networking based on cell switching. Toward that goal, BBN pledged to provide T1 and frame-relay support on its new T3900 packet-switching node and integrate its proprietary network management tools and applications on **Digital Equipment Corp.**'s **EMA** architecture by 1993.

### What a CAD

Nostalgia is unlikely to be the reigning sensation as the computer industry bids adieu to 1990 next month; it might run high, however, in the CAD/CAM/CAE sector. According to a recent report from market research firm **Darastech, Inc.**, 1990 was a banner year for vendors in this arena, with overall revenue growth at 14.2%, up two points from 1989, and the three market leaders — **IBM**, **Intergraph Corp.** and **Prime Computer, Inc.**'s **Computervision** division — all posting solid double-digit increases. For Huntsville, Ala.-based **Intergraph**, in particular, 1990 should evoke fond memories as the year in which the firm broke the \$1 billion barrier, moved securely into the No. 2 position in the CAD/CAM market and outscored all direct competitors in user satisfaction, according to **Darastech**.

## Filling in the gaps with Brownstone

DB2 development software firm makes its mark where giants don't tread

BY CLINTON WILDER  
OF STAFF

**NEW YORK** — Think of development repositories, DB2 tools and computer-aided software engineering (CASE) methodologies, and you have to think big. Big names such as **IBM**, **Andersen Consulting** and **KnowledgeWare, Inc.** come to mind — and **Brownstone Solutions**.

Who? Brownstone, a 4-year-old, 16-employee software company tucked amid the bustle of midtown Manhattan, plays in the neighborhood of the big boys. In fact, Brownstone has something that the big boy named **IBM** doesn't have yet: a DB2-based data dictionary, called **Data Dictionary/Solution (DDS)**, that provides an environment for a DB2 software repository.

What made the Brownstone's founders take their game to this arena?



Brownstone's Stone (left) and Brown found a need and filled it

"If we'd thought about it too hard at the time, we wouldn't have done it," director **Barry**

**Brown** explained. "Selling strategic software to **Fortune 500** companies as a two-person out-

fit? People said we were crazy. But we didn't think of it that way. We just had ideas that we wanted to work on."

The company takes its name not from the handsome **Murray Hill** townhouses that line the streets near its office, but from the names of its co-founders and co-directors, **Brown** and **Lewis Stone**. These guys are not even "thirtysomething" yet — they are 30 (well, **Brown** turned 31 last week). And their highly specialized, highly technical software niche has doubled Brownstone's revenue every year so far and landed the company several accounts that include **Gilbane NA**, **Merrill Lynch & Co.**, **General Mills Corp.** and **Metropolitan Life Insurance Co.**

**Brown** and **Stone** met right  
Continued on page 82

## Smart cards coming to forefront in Europe

BY PHILIPPE ROSE  
OF STAFF SERVICES

**PARIS** — From telephone cards to banking applications and pay-per-view television, smart cards are evolving into a mass market in Europe. According to market research firm **Dataquest, Inc.**, European smart-card production is expected to increase 35% annually and reach 200 million units by 1994, compared with 45 million units in 1989.

Currently dominated by credit cards and prepaid telephone cards — which are not "smart" — the value of the European memory-card market is expected to multiply 8½ times to total \$139 million in 1994, compared with its 1989 value of \$16.3 million, a compound annual growth rate of 54%.

Production of prepaid telephone cards, or token cards, and smart cards used in the banking sector currently account for more than 95% of the market. France's **Bull S.A.**, **Gemplus**, **Schlumberger Ltd.** and **Signe Montepique** manufactured 41 million token cards in 1989, largely used as prepayment cards for public pay phones, vending machines and parking lots. Together, these firms ac-

count for about 57% of total memory-card production.

More than 95% of the token cards manufactured were used by **France Telecom** as prepaid public telephone cards. This market is expected to continue to expand, according to **Dataquest**. Most European countries, including **Finland**, **Ireland**, **Norway**, **Germany** and **Spain**, have recently adopted this form of payment.

The study revealed that in 1989, four out of 10 smart cards produced were for banking applications, mainly in **France**. These memory cards are destined to replace the traditional magnetic-stripe credit or bank cards introduced at the end of the 1960s. While the production cost remains the same, the banking "smart card" offers two new features: security obtained through local control of a confidential code and the ability to use integrated circuits to incorporate additional services. After much hesitation, **France** has committed itself to this type of smart-card technology, essentially for security reasons.

However, the **Dataquest** study revealed that adoption of smart cards across Europe has not aroused enthusiasm from

banks, which believe that the savings from prevention of fraud are not sufficient justification alone for migration away from magnetic-stripe credit cards.

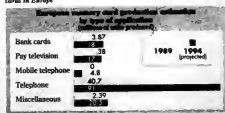
**France** and **Norway**, however, are proving to be exceptions to the conservative European banking rule. According to **Dataquest** analysts, French banks — with four million out of the 19 million cards equipped with chips — work closely with the strategic initiatives in information technology advocated by the French government. In **Norway**,

52% and 37% share of units produced, respectively. These figures compare with 86% for telephone applications and 8% for banking solutions in 1989.

Pay-per-view television, which accounted for less than 1% of the total market value in 1989, is expected to grow to 17% by 1994, according to **Dataquest**. The first fruits of prepaid TV viewing began with the British movie channel **Sky Channel** in February and with the **Canal Plus** station in **France**. French firms such as **Bull** are also focus-

### Get smart

Banks and pay television are leading the surge toward "smart" memory cards in Europe



Source: **Dataquest, Inc.**

OF STAFF Paul Mack

the fixed lines needed for on-line processing are so expensive in comparison with similar costs in the rest of Europe that smart cards are necessary.

Telephone and banking applications will continue to monopolize the smart-card market at least through 1994, holding a

long on this market niche.

"By the year 2000," said **Jonathan Drasin**, an analyst at **Dataquest Europe**, "we expect to see one card per human being in Europe."

**Philippe Rose** is a writer at **Le Monde Informatique**, an **IDG** publication.

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# Andersen guards No. 1 status

Consultancy exec enjoys firm's success; analyst notes its Achilles' heels

BY ELLIS BROOKER  
CHICAGO

CHICAGO — "If they write a postmortem on Andersen Consulting a decade from now," declared George T. Shaheen, managing partner and chief executive officer, "it'll say, 'They didn't take advantage of the position they had.'"

Jealously guarding that position as one of the world's premier systems integrators appears to be Job No. 1 for Shaheen, who seems genuinely convinced by the message his firm routinely gives to its clients: "In the '90s, change will happen dramatically, quickly and will be very final," he said. "There will be winners and losers."

For the moment, however, Andersen enjoys an enviable and winning position. The company, one of the two business units of The Arthur Andersen Worldwide Organization, posted a 30%

revenue growth from \$1.44 billion to \$1.88 billion for the fiscal year ended Aug. 31. By the end of 1991, the firm hopes to have grown from 22,000 to 26,000 or 27,000 employees and have revenue from the \$2.4 billion to \$2.5 billion range, Shaheen said.

## A holistic approach

Analysts credit Andersen with taking a holistic approach to consulting. The firm broadened its "main-line" business of systems engineering several years ago to include strategic consulting on the front end, training and organizational consulting — what Andersen refers to as "change management" — on the back end and facilities management in between.

"They are very smart in terms of pulling technology as opposed to pushing it," said Rich Peterson, president of Impact Research, Inc. in Upper Montclair, N.J. "They think process

rather than product; they think business rather than technology."

Nevertheless, Peterson noted at least two areas in which Andersen is marginally vulnerable. First, he said, there are Andersen's prices, which Peterson estimated are up to 20% — and in some cases 50% — higher than those of its competitors.

Given this, Peterson has a hard time accepting the theory that outsourcing customers get much of a break. "I just can't imagine Andersen supplying people at rates comparable to [those of] the in-house organization," he said.

Andersen overcomes such comparisons, Peterson said, by telling customers that it will bring in top talent to re-engineer

the data center — both its operation and applications — and make it more efficient and capable.

However, this leads to another vulnerability, he said: the fact that Andersen does not have enough "heavy hitters" to go around.

According to Peterson, this is a frequent complaint of customers who may be sold on Andersen on the weight of a very senior partner only to see the job handed to junior personnel once the contract has been inked. "You're sold the Cadillac, and the Plymouth shows up," he said.

Andersen's answer is that at Andersen, even the bottom of the corporate ladder is at the top of the line. Grooming its staff — 9,000 employees in the U.S., 22,000 worldwide — is a cornerstone of the approach favored by the firm, which spends 8% to 10% of its earnings on training and has committed \$150 million to a five-

year retraining effort focused on the St. Charles, Ill., campus it acquired in the late 1970s.

Change, volatility and the strategic advantage companies can realize in such times are what fuel Shaheen's vision of Andersen and what prompts him to keep a watchful eye over his shoulder, he said.

On the short list of firms he considers competitors, Shaheen included General Motors Corp.'s subsidiary Electronic Data Systems Corp., IBM and European-based CAP Gemini Sopet.

While gracious toward these challengers, Shaheen managed to suggest that each lacks something, from a strong international presence to a diversified product line, that maps against Andersen's mix of services and products.

Shaheen expressed confidence that Andersen will continue to see a stream of clients despite the worsening worldwide economy. "There will be scrutiny and rigid expectations [by customers]," he said, "but I do not feel information technology will be subjugated to a second-tier priority."



Shaheen expects continued growth

## REPORTER'S NOTEBOOK

# Adapso: Names, games, videotapes

BY PAUL GELLEN  
CHICAGO

Few people recall what the old screens stood for in the first place, and soon no one will even have to try: Adapso, the software and services industry organization, is changing its name to the Information Technology Association in a stated effort to "be a voice of the entire information technology industry," said Adapso President Luanne James at the association's semi-annual meeting early this month. However, the move may be prompted as much by a need to bolster sagging membership as by an effort to be an industry leader. Adapso lost about 100

members in recent years. It plans to take another stab at bolstering membership by recruiting hardware-only firms but is unclear how aggressive it plans to get. Outgoing Chairman David Ekra indicated the plan on a list of major Adapso goals in a speech to members. Certain Adapso hot buttons have become crucial to hardware as well as software firms. However, James noted, "I'm not going to tell you I expect a bunch of disk drive makers to suddenly join."

Despite a near-tragic incident in which a conference attendee was bitten by a tiger hired as part of the entertainment, the charity benefit roast of Dan & Brad-

street Software Chairman John Imlay went ahead. Among the singers aimed at Imlay and others on the podium: "As a child, little John developed an uncanny ability to locate his parents each time they moved to a new location" — Georgia Sen. Sam Nunn.

"At D&B, he is the awkward position of being forgotten but not gone," — Attorney Robert Seede.

[Knowledgeware Chairman] Fran Turkenton attended Georgia State on a full athletic scholarship, which as you know includes the crayons and everything. — Seede.

Women now hold the top two po-

sitions at Adapso. Judith Hamilton, a partner at Ernest & Young, was elected to a one-year term as chairman earlier this month, and James was promoted from executive director to president.

One hit of the conference was a

five-minute rap video aimed at schoolchildren and promoting computer careers. The video, which was produced by an Adapso committee on a \$1,700 shoestring budget, uses rap-style film clips and a thumping rap in which the members are in computing look and fan.

# Seagate not planning to build optical disc drives

BY MAURA J. HARRINGTON  
CHICAGO

Seagate Technology, Inc. has no plans to incorporate any optical disc drives into its product lineup in "the foreseeable future," Chief Executive Officer and co-founder Alan Shugart told *Computerworld* during an interview at the Comdex/Fall '90 show earlier this month in Las Vegas.

"We have no optical disc drive efforts going on right now... and we don't think it's compatible with any of our mainstream markets," Shugart said. "As long as magnetic recording technology continues to increase... we don't see [optical] as a viable competitor."

In addition to already having a profitable established product line, Shugart said, Seagate is reluctant to dive into optical drives because the market is still a niche market, the governing standards are too few, and the prices are too high.

However, he said, that is not to say the firm won't profit from

other emerging technologies.

"Multimedia technology and the general growth of computers will cause our company to grow, even if Shugart said."

Indeed, Seagate has grown considerably in the past year. Including its acquisition of former Control Data Corp. division Impression, Inc., the company's net income rose from \$340,000 in 1989 to \$1.17 million in 1990. In addition, net sales almost doubled, from \$1.37 billion in 1989 to \$2.41 billion in fiscal 1990, ended June 30.

Shugart said there is plenty of room for the company to grow even if Shugart said.

Seagate, he said, is focusing on very high-end technology for data-intensive users — nine-head magnetic storage devices, for example — and on increasing its position in the 2½-in. drive market in noncomputer applications.

"I think that by the better half of this decade, we'll see noncomputer applications that are just as exciting as [those for] computers," Shugart said.

# Taiwan pours money into its own microchip development

BY CHRIS BROWN  
LOS ANGELES

TAIPEI, Taiwan — Midway through a five-year semiconductor research plan, Taiwan has decided to redirect its energies into developing its own semiconductor mass-production process.

Taiwan's \$214 million semiconductor development plan, which was initiated in 1988 by the Ministry of Economic Affairs, has come under scrutiny during the last few months. Government planners said they want to see Taiwan develop its own semi-

conductor manufacturing process so that it can mass produce integrated circuits for the international market.

The new plan is backed by top-level government leaders. Shi Yan-hsiung, director of the government's Science and Technology Advisory Group, has been one of the supporters urging Taiwan to develop its own semiconductor development technology.

In the past, the state-sponsored Electronics Service & Research Organization (ESRO) has focused mostly on design of inte-

grated circuits. But it is now beginning to sign up foreign firms to help out with the submicron project. An August agreement between ESRO and U.S.-based Applied Materials Technology is the latest example.

Taiwan is looking particularly to develop its own fabrication process technology. One plan from the Ministry of Economic Affairs calls for the government and private industry to jointly invest in projects.

ESRO is expected to draw up a blueprint for the memory chip venture by 1992. Last year, Taiwan's Acer, Inc. and Texas Instruments, Inc. signed a joint venture to co-produce 4M-byte memory chips with Taiwan starting in the third quarter of next year.





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# Dealer, reseller channels a must in Europe

BY MAURIL HARRINGTON  
OF STAFF

MUNICH, Germany — Information systems managers aiming to help their companies expand their computer operations in Europe, take note: Business in Europe is a whole different game.

So says Jochen Tschunke, founder and chairman of Munich-based Computer 2000, which sells to about 15,000 dealers and resellers in Europe.

The IS manager who plans to buy products in Europe, he said, will no longer be able to bank on buying directly from a distributor. The computer reseller channel is much stronger in Europe than in the U.S., Tschunke said. Moreover, he added, end users have more incentive to buy products — which tend to be between 10% and 15% more expensive — through this channel because it offers more end-user support.

"The reseller channel is much different here than [it is] in America," Tschunke said. "It is much more decentralized in Europe."

Tschunke, head of one of the fastest growing distribution

companies in Europe, said that mail order buying — the other apparent purchase option of choice in the U.S. — is also relatively available in Europe. "That doesn't really fit into the way Europeans do business, and it hasn't spread here like it has in the U.S.," Tschunke said.

How does one find a decent reseller in Europe? Tschunke may tell you to make sure the reseller's distributor is selling only quality goods to the resellers, as he himself claims to do.

Whatever Computer 2000 is doing appears to be good for the company's business. Service,

Bent on becoming Europe's largest peripherals and software distribution company serving the IBM Personal Computer and compatibles market.

By 1992, Computer 2000 has a significant lead on many of its German counterparts, most of which have revenues hovering in the \$65 million to \$100 million range, according to Doug Kass, a distribution and retail chain analyst at Dataquest, Inc., a market research firm based in San Jose, Calif.

Competition is increasing from U.S. distribution giants such as Ingram-Micro D Corp. and Merisel, Kass said. However, Tschunke claimed that Computer 2000 has an edge because it is a European company with an understanding of the European way of doing business.

"Many other distribution companies do not account for cultural differences when they are making their forecasts," he said. "For example, some European companies will laugh at you if you tell them you want their

money before 180 days after the sale," Tschunke said, adding that it would be a cultural faux pas to expect the money.

Founded in 1983, Computer 2000 claimed that it has always been profitable, with a 128% increase in total sales volume for the 1990 fiscal year.

Posted year-end revenue for the company jumped to 600 million deutsch marks, compared with 362.8 million deutsch marks in total sales volume for fiscal year 1989, according to Tschunke.

"We are positive," he convinced that we will go over 1 billion deutsch marks in sales by the end of 1992, which is about \$700 million," Tschunke said.

With operations in Germany, Switzerland, Austria, Spain, the UK, Belgium and the Netherlands, Computer 2000 has plans to slow down its growth. Tschunke said the company plans to expand its operations into Eastern Europe, Portugal, Italy and France through acquisitions and alliances.

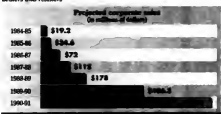
While he did not foreclose the option of expanding to the U.S., Tschunke said the company's main focus rests on Europe.



Tschunke will buy products in Europe

## Way to go

Munich-based Computer 2000 credits its rise to its ability to deal with dealers and resellers



CP Chart Fax Week

Across the Atlantic, he said, this is how it goes: Distributors buy from manufacturers and sell to the retail chain, which in turn sells to users, usually at prices 10% to 15% higher than the cost of the same product in the U.S.

support and one golden rule — which is never to compete with systems manufacturers or dealers — has brought the company's revenue up to an estimated \$400 million for fiscal 1989, which ended in September, Tschunke said.

## Brownstone

FROM PAGE 77

out of college while working together in the early 1980s at Arthur Andersen & Co.'s technical services organization — the predecessor of today's Andersen Consulting.

Working on large-scale development projects for big clients such as First Boston Corp. in the early days of DB2, the two perceived a need for better development tools.

"Instead of doing it with manpower, the way Andersen would, we thought we could do it with software," Brown said.

Thus were born two unlikely entrepreneurs, who left Andersen to consult by day and code by night in their equivalent of the legendary boys/Woman garage: Brown's New York studio apartment. "We started as technicians, and we still are," Stone said. "You can get us more excited about a new technology innovation than about the dollars coming in next quarter."

Brownstone, which forecasts revenue of about \$2.2 million this year, has a history that is almost too storybooklike to believe. "When we went to open our first corporate bank account and they asked us for a deposit, Lew and I each reached into our pockets and pulled out a \$20 bill," Brown recalled with a laugh.

Since then, spurning the

overtures of venture capital firms, Brownstone has been self-financed. It has released an enhanced version of its core DDS product every year and developed three add-on products.

Along with several moves into successively larger Manhattan office spaces because of growth, it has opened sales offices in Philadelphia and Chicago and plans a San Francisco opening by the end of the year. The firm also runs a small development center in Norwalk, Conn., where programmers working on products can "babysit," Brown said.

**Bigger than both of them** Brown and Stone admitted that their company's size posed a marketing challenge in the early days, when some necessary requesting a credit check on their finances from The Dun & Bradstreet Corp. "But that doesn't happen anymore," Brown said. "The typical user assumes we're much larger than we are."

And bigger is not necessarily better, said Brownstone user Lucy Cole, data-services manager at Hewlett-Packard Co.'s Information Systems Group in Palo Alto, Calif. "Smaller companies tend to be more responsive, and that's a very positive thing," Cole said. "They're unlikely to promise what they can't deliver. With Brownstone, we've been able to rely on their delivering what they say they will."

Brownstone's three add-on

products to DDS is the past three years a DB2 Administration, a suite of tools for DB2 administration; IMS Admin/Sort, a comparable tool set for the older IBM database management system; and IE Admin/Sort, a link between Knowledgeware's workstation-based programming and Brownstone's DDS repository on the mainframe.

Future product plans include workstation-based graphical interfaces to Brownstone's mainframe tools. The company is also considering links to the development environments of other leading CASE vendors such as Index Technology, Inc. and Bachmann Information Systems, Inc.

But the biggest question looming over Brownstone's future is a few miles north in Westchester County, N.Y. When IBM fills in the gaps of AD/Cycle and delivers its full repository, will Brownstone's niche disappear?

"We will continue to provide a dictionary and tools on top of the IBM Repository," Stone said. "We don't feel like we're in the path of the steamroller."

"When we started," Brown added, "the sky was all blue. A lot of CASE and DB2 tools have come out since then, but we have adapted. And we have twice as many ideas for new products now as when we started. We see our future role as something like software systems integrators."

Moreover, it is not a foregone

conclusion that Brownstone users will migrate to the IBM Repository when the day arrives. Early Brownstone customer Pacific Bell in San Ramon, Calif., is "in a constant state of evaluation" about the migration decision, systems analyst Bob Jones said.

## INTERNATIONAL BRIEFS

### Olivetti cuts deeper

In the face of tough times in the European computer industry, IT's Ing. C. Olivetti & Co. is reportedly about to cut another 7,000 jobs at its worldwide work force. Olivetti, which has 57,000 employees worldwide, has already cut 3,500 this year and 2,000 in 1989 as part of a major restructuring plan. During the past two years, the firm reorganized its business into four operating firms to halt slumping profits caused by declining demand, stiff competition and the strong lira.

### Taking notes

An alliance of 47 Taiwanese firms is gearing up to launch what will soon be the standard notebook computer for Taiwan. The firms are aligning Taiwan's state-sponsored Computer & Communication Laboratory to agree on a design specification

that [Brownstone] will provide the IBM PC is not clear, but IBM so far is not providing a lot of tools," he said. "My own personal opinion is that before we migrate, we want to make sure that we won't lose any of the functionality that we currently have."

and standard parts. Meanwhile, the notebook made its debut at Comdex/Fall '90 in Las Vegas.

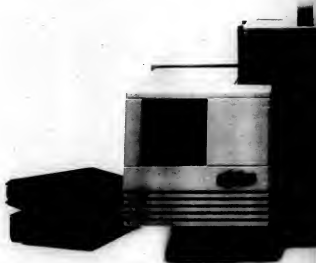
### Universal Unix

AT&T is launching out in Asia to license its latest version of Unix to hardware firms and to win over Unix software developers. Tokyo-based Unix Systems Laboratory Pacific, an AT&T spin-off, has set up offices in Taipei and Seoul, South Korea, over the last two months. The firm has already been operating in many Asian markets for several years.

### Submarine nets

NEC Corp., Fujitsu Ltd. and Ocean Cable Co. have signed a contract in Brunei to construct an undersea fiber-optic cable network linking Brunei, Singapore, Malaysia and the Philippines, all members of the Association of South-East Asian Nations. The Brunei-Singapore connection should be complete by November 1991, with the line from Brunei through Malaysia and the Philippines operative two months later.

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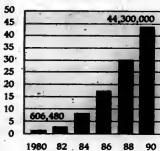
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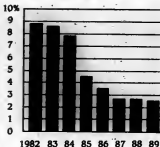
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# COMPUTER CAREERS

## The viability of telecommuting in IS

BY KEVIN BURDEN  
CW STAFF

**T**elecommuting — working at home using a personal computer and modem linked to the office — is allowing many professionals to boost productivity while avoiding the grind of daily commutes. But is it appropriate for all types of workers?

The answer for information systems professionals depends greatly on the nature of their jobs and their managers' attitudes toward telecommuting. For example, Pacific Bell in San Francisco, which has had a formal telecommuting program in place since 1984, is a strong advocate of telecommuting because it allows employees to maintain flexible hours.

"When you have someone who can solve a problem in the middle of the night, it's much easier for them to roll out of bed and walk 20 steps to their computer than hop in the car and drive 20 miles to the office," says Steve Cotler, Bay Area vice

president at Pacific Bell.

At Blue Cross/Blue Shield in Washington, D.C., Anne Nable, a systems programmer, sees a similar advantage. "Because our computer system stays on-line 24 hours a day, I can catch up from home anytime if I fall behind."

Increases in productivity, although difficult to measure, are often cited as a key benefit of allowing employees to work in outlying locations.

Most companies can expect a 20% productivity hike from telecommuters, regardless of the type of work, says telecommuting proponent Gil Gordon, president of Gil Gordon Associates in Monmouth Junction, N.J. Companies also report enhanced work quality, heightened employee morale and lower relocation expenses as a result of telecommuting policies.

Telecommuters say that their overall working conditions vastly improve. They can spend more time with their families by not having to make a round-trip of as

much as two hours per day, and they claim to feel less stress.

However, if a company or manager gives the green light to telecommuting, employees must determine whether telecommuting is viable for the types of jobs they perform.

Workers whose physical presence in the office isn't necessary for their jobs are at a clear advantage. Programmers and analysts, for example, can create the essential materials from their offices in a briefcase and effectively work at home on their own PCs. Even some IS managers find they can telecommute on a part-time basis.

However, telecommuting is not a utopia, and it can cause some problems. First, there is something to be said for working in an interactive office environment. Many offices foster a team atmosphere in which an employee can walk 10 steps to a neighboring cohort to ask a question that might take 10 minutes or longer to answer by calling from home.

Although the more autonomous the better, telecommuting is most conducive to those workers who don't need frequent contact with the outside world. Unfortunately, a good portion of IS jobs are service-oriented. Many IS executives act as firefighters for the host system and must be on-site.

According to Diane Bengtson, IS human resource director and a telecommuting manager at The Travelers Corp. in Hartford, Conn., those professionals who support highly technical systems are just

### Winning the bronze IS positions are the third most common telecommuting job

Percent of telecommuters in knowledge working occupations  
Total: 2.61 million



Source: Link Resources CW Chart Paid Mock

not suited for telecommuting.

Getting management to buy into telecommuting is easier said than done, says Jack Nilles, a telecommunications consultant. "IS managers feel that the work won't get done unless their people are huddled around each other."

The county of Los Angeles, which employs 8,000 people, reports that only 10 of its 700 telecommuters are IS workers. "Our IS department has been slow

in starting telecommuting, but that's a management issue," says Margery Gould, the county's project manager for the telecommuting program.

The problem is that managers have to make some big adjustments in their work styles, Nilles says. All of a sudden, they can't see what their employees are up to or how long they're at lunch. They must base management decisions on end results of the work performed.

Another pitfall to telecommuting is the difficulty of setting a worker up at home with the proper equipment. While many employees in the IS profession already own PCs, they're accustomed to working on state-of-the-art technology at work.

While telecommuting isn't a revelation for all, it does offer workers and their companies some undeniable benefits. And although office buildings are not expected to empty out, experts predict that in the years to come it will be hard to find companies testing telecommuting.

Burden is the research coordinator at Computerworld.

## If the shoe fits...

Autonomous, computer-intensive positions fit the telecommuting bill best: market researchers, salespeople, journalists and IS professionals. But even within these professions, there's a fine line between who is suitable and who isn't. The following requirements are key attributes of a successful telecommuter:

- Work can be transported to and from the office.
- Interpersonal communication is not vital to the job.
- The employee is an independent worker.
- The tasks and deliverables are clearly defined.
- Work activities are measurable.
- The work is cost-effective, not process-oriented.
- The worker has a working knowledge of a telecommuter's most valuable and useful tools — the PC and modem.

KEVIN BURDEN

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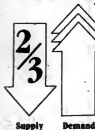
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Indeed, during the past 18 months, several well-known vendors have entered the market. For example, IBM, recognizing the potential sales volume represented by rental companies, has authorized three pilot rental centers; Digital Equipment Corp. is planning a similar program

Calhorne is a consultant in Highland, Md.



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# TRAINING

## Retraining for changing times

As IS moves ahead, professionals are forced to learn or perish

BY KATIE CRANE  
SPECIAL TO C/P

Information systems veterans who have watched their profession grow since its infancy are now facing a hard-boiled choice: retrain or be replaced.

To accomplish this, IS executives must alter their outlook from one that is strictly technical to one that also focuses on business strategies, says Bob Shusser, vice president of IS management at Northrop Corp.'s Aircraft Division in Hawthorne, Calif. Those who don't, he says, may lose their jobs.

Furthermore, the threat doesn't just apply to top IS executives, says Kay Redditt, president of Cognitech Corp. in Easton, Conn. She insists that systems professionals must also change to reflect the cultural shift in IS organizations today. While there is still a demand for technical expertise, there is also a stronger need for negotiating abilities, interpersonal skills and business savvy as companies insist that IS professionals develop a business perspective. Even systems analysts are expected to step in by experts and become consultants to users, she says.

### Train to remain

It boils down to this: "Retrain or die," says Lewis Leeburg, director of the Information Systems Research Program at the Anderson School at the University of California, Los Angeles (UCLA), one of the many programs attempting to address

these issues. He says he believes training scenarios will vary depending on the structure of the IS organization, the nature of the business, its corporate culture and the current skills and attitudes of the IS professionals. But in one way or another, they have to change. For many, that means retraining.

Concurrent with the tough realities facing veterans IS executives, firms are also grappling with their own issues — namely, whether to outsource or hire outsiders to fill those roles rather than re-educate current employees.

Many of Redditt's clients are recurring business school graduates on the theory that it is easier to teach them technical skills than it is to teach veterans the interpersonal communications, negotiation and facilitation skills they would need to change.

Even retrained IS executives can become victims of the Peter Principle, says Bill Harris, chairman of Behlke Harris Associates, a management consulting firm in New York. Many professionals who acquire the business acumen don't always have the political savvy to deal with the business' cultural demands. "For this reason, many companies turn to business-trained executives to replace or step in over the IS manager," he says.

However, the strategy of replacement doesn't always work, says Richard Kish,

vice president of MIS at Waldenbooks in Stamford, Conn. Kish admits that he falls more into a younger generation, having risen to his current position in just 12 years. But he has built his career on a strong base of technical skills. The business savvy came later as he learned how to discuss technical decisions in business terms.

"My boss doesn't want to know we're putting in an ES/9000 next year, he wants to know if that means we can expand our tele-ordering operations," Kish acknowledges that his kind of thinking may not be widespread and that "there are still plenty of folks who have yet to change."

Fortunately, many companies opt for the retraining rather than replacement. They are developing in-house programs or sending employees elsewhere for assistance.

The Association for Systems Management (ASM) offers courses and seminars to help IS veterans learn about their new roles. Among the most effective ASM offerings are the local chapter meetings, says Charles Block, director of education. The members determine the programming, and more often than not, a typical dinner meeting will focus on a business topic such as, "How to sell your ideas," rather than a technical topic.

Slusser cites accelerated management programs such as those at Harvard University and Stanford University and programs such as Leeburg's at UCLA as the most frequent sources of retraining for IS people, particularly those at the top.

However, while plenty of companies are addressing the need for skills training, little is being done to address attitude change, Redditt says.

That's why Harris advocates that chief information officers address retraining within a larger context. He sees it as a vital part of the total IS planning process, first tying each IS project to some strategic or tactical business objective, then defining the resources needed to do the job well. Seen in that context, he says, "There will probably always be a need to retrain, retrain and acquire new skills."

### Map out a course

Joe Iano, vice president of information technology at A.T. Kearney in Santa Monica, Calif., agrees with this approach but adds one caveat: These higher-level IS executives must start with a vision and then map out a very purposeful program for retraining selectively, starting with themselves. "You're on the wrong track if you're trying to retrain the entire IS organization," he insists.

The other side of the argument is that retraining responsibilities shouldn't rest entirely on a company's shoulders. "Those of us who have survived have been through a half-dozen evolutionary changes. If you don't change, you're history a long time ago!" says Gary Kirkham, a 25-year veteran of the profession now at Forrester Planning Associates in Dallas. The ones who want to stay on the leading edge will take the initiative themselves, he adds.

"It's a tough world out there. Not everyone will survive the evolution of this species," Kirkham says.

Crane is a free-lance writer based in Norwich, Vt.



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## NEWS SHORTS

### New PCs from Memorex Telex

Tulsa, Okla.-based Memorex Telex Corp. fished out its personal computer hardware line last week with several PCs, a synchronous or asynchronous remote controller and a token-ring adapter. Memorex's Model 7038 PC is based on Intel Corp.'s 80386SX chip and is priced starting at \$2,295. The company also released 80286- and 386SX-based boxes that can display four simultaneous host sessions in an IBM 3270 environment. The PCs sell for \$7,495 and \$4,295, respectively. The firm's STP 6541 Multifunction Communications Controller costs \$4,125, and the IBM Personal Computer AT-style or Micro Channel Architecture token-ring adapters cost \$995 and \$925, respectively.

### Hyundai loses court battle

A California jury last week ordered Hyundai Electronics America to pay \$450,000 to Lifetime Memory Products, Inc. to resolve a 2-year-old dispute with the Huntington Beach, Calif.-based distributor. The case evolved after Lifetime Memory Products, then known as Columbia International, charged that Hyundai breached a contract to deliver 100,000 dynamic random-access memory chips to the company at \$1.05 each during the U.S. memory chip shortage of 1988. Hyundai said in a written statement that it will appeal the verdict, while an attorney for Lifetime Memory said the company will seek to make Hyundai cover the plaintiff's legal expenses.

### Cost of VDT low pegged

San Francisco's proposed VDT ordinance would have a one-time cost of between \$73.2 million and \$120 million, said city budget analyst Harvey Rose. More than 60,000 workers would be covered by the law, which would require work spaces to have adjustable desks and chairs, nonglare lighting and positioning of workers at least one meter from the back of a VDT.

### CFOs to watch federal systems

President Bush last week signed legislation establishing chief financial officer positions at 23 federal agencies. The bill also establishes a presidentially appointed super-CFO within the Office of Management and Budget. The CFOs are expected to oversee agencies' financial systems and prevent fraud.

### CDC selling trading-room group

Control Data Corp. last week concluded a six-month search for a buyer for Micropropos, its \$100 million trading-room systems unit, agreeing to sell to CSK Corp., Japan's largest independent computer service company. CSK officials said they hope to use the Danbury, Conn., company, which provides integrated trading floor systems, as a springboard for its international business. Terms for the sale were not disclosed.

### Printer groups to merge

Storage Technology Corp. in Louisville, Colo., and Siemens Nixdorf Information Systems, Inc. in Burlington, Mass., signed an agreement last week to merge their respective U.S. high-performance, nonimpact printer operations. The joint venture is slated to become operational in January 1991. Upon closing the deal, Siemens Nixdorf will own 51% of the operation, and Storage Tek will own 49%. Storage Tek anticipates that more than 100 of its employees will be transferred to the new entity.

### Mosaic faces court woes

The copyright infringement trial of Lotus Development Corp. vs. Mosaic Software concluded last Wednesday in Federal District Court in Boston. During the two-day trial, Judge Robert E. Keeton fined Mosaic \$12,500 for unnecessarily delaying the trial, but Mosaic said it is having difficulty raising the money. If the fine is not paid on time, Mosaic automatically forfeits the trial, a Lotus spokesman said. This may be a moot point, as Keeton told the court he is leaning toward ruling against Mosaic, adding that he cannot envision anything Mosaic may say in a post-trial brief that would change his mind.

## Quake threat has Midwest edgy

BY ELLIS BOOKER  
OF ST. LOUIS

ST. LOUIS — Better safe than sorry. That is how some information systems executives in the Midwest are reacting to a controversial prediction that a major earthquake will rock the region next Monday or Tuesday.

Some data centers have scheduled hot-site recovery mission systems exercises with the prediction, and one user contacted by *Computerworld* last week said he made contingency plans on the basis of self-taught meteorologist Irvin Browning's prediction of a quake along the New Madrid seismic region. The area is centered in southeast Missouri and northeast Arkansas and extends into parts of Illinois, Indiana, Kentucky, Mississippi and Tennessee.

The Browning prediction, roundly dismissed by geophysicists, holds that there is a 50% chance of a "tidally triggered" quake measuring 6.5 to 7.5 on the Richter scale on Dec. 2 to Dec. 3, give or take two days.

E. D. Jones & Co., a retail brokerage house in a St. Louis suburb, is taking the prediction seriously. "We're not planning on a pre-emptive declaration or positioning people in hot sites, but we want to make sure we can successfully pull the pieces back together if it does happen," manager of computer operations Tom Barry said.

According to Barry, his department discussed the possibility of a pre-emptive disaster declaration but backed away after calculating it would cost more than \$500,000 per week.

Meanwhile, the brokerage house, which has 1,600 retail offices in 42 states, is taking extra

precautions. It has hardened its St. Louis headquarters, spending \$20,000 on bracing and securing electrical systems and the cooling and air-conditioning system in its 17,000-sq-ft data center. The company will also pay extra to have its backup data tapes transferred to Kansas City, Mo., for two weeks.

### Mother of two

"These are the kinds of things that should be done anyway," said Barry, who reported that many of his counterparts in the

firm's third for the year — had tentatively been scheduled for some time in December, and the fact that it was moved to early December does not indicate undue panic, Moran said.

If someone believes there will be a catastrophe during the critical pre-Christmas season, Moran said, "We're going to listen but not overreact."

Long-distance company AT&T, which has major routes through St. Louis — including the hub for its 800 service — is also bracing for Dec. 3.

**"W**E WANT to make sure we can successfully put the pieces back together if it does happen."

TOM BARRY  
E. D. JONES

St. Louis area are similarly anxious about next week. "A lot of people are taking the same precautions we are... and some are taking even more," he said.

If a quake comes, mail-order company House of Lloyd will be in an excellent position, as it will be inside a Comdisco Disaster Recovery Services, Inc. (CDRS) hot site in Wood Dale, Ill.

Jack Moran, vice president of IS at the firm, said the company ships the majority of its orders in an excellent position, as it will be inside a Comdisco Disaster Recovery Services, Inc. (CDRS) hot site in Wood Dale, Ill.

Among other routine precautions, the Kansas City firm outfit all of its 100 IS employees with beepers and added a backup generator to support the IBM 3090 300E in its data center during this part of the year.

The Wood Dale text — the

"We're taking the prediction seriously," a company spokeswoman said, adding that a team of network engineers has been assembled to retrofit trunks and minimize network damage.

"Business has increased about twofold," said Richard B. Zane, president of the North American division of CDRS.

CDRS has not added staff or modified its recovery center in advance of Dec. 3, according to Zane, although he said the staff had been made aware of the concerns of some customers. "It's really business as usual," he said.

The New Madrid fault was the site of the strongest series of earthquakes in U.S. history in late 1811 and early 1812. Missouri and Arkansas both received two major quakes, estimated to have been in the 7.8 to 8.3 range on the Richter scale.

## Hackers

FROM PAGE 1

"It is a new reality — not a virtual reality — that you will go to prison," said William Cook, an assistant U.S. attorney in Chicago. "The sentences reflect the judge's and society's concern that the hackers are trying to use the telecommunications industry as their playground. Well, the playground is closed."

The severe sentences should also send a signal to corporations that have been victimized by computer hackers, Cook said. "It should say that it is worthwhile for you to cooperate when unlawfully violated by people who back into your system and that it is worthwhile in sentencing and in terms of the restitution that we will call for."

The three hackers, members of a self-proclaimed elite group of about 15 hackers called the

League of Doom, could have received sentences of between five and 10 years and fines of \$250,000. However, attorneys for the Justice Department recommended lighter sentences, because the trio provided information that was helpful with investigations of other Legion of Doom members.

Dardas, who used the handle The Leftist, and Riggs, who called himself The Froghop, pleaded guilty to a conspiracy to commit computer fraud, wire fraud, access code fraud and interstate transportation of stolen property. Grant, who operated as The Urvile and Necron 99, pleaded guilty to a separate count of possession of long-distance telephone access codes with the intent to defraud.

Gail Thackeray, an assistant attorney general in Arizona who has investigated and prosecuted a number of computer-related crimes, said the sentencing indi-

cates that the legal system may be moving toward a more consistent approach to prosecuting computer-related crimes.

The courts are focusing more on the intent of the computer hacker in handing out sentences, Thackeray said. The sentences will be more severe in cases such as the BellSouth case, in which the hackers carried out "deliberate, vicious attacks" with the intent to do harm. Trespassing in a computer system or engaging in reckless behavior by exploring a system's electronic innards will continue to draw lesser penalties, Thackeray said.

In the days leading up to the sentencing, some security experts said hackers would launch an attack on telecommunications systems as a form of protest. BellSouth received reports of the threats, but no attempts were made to disrupt the system, said Sam Ticer, operations manager at BellSouth.

## Global

FROM PAGE 1

Ltd., both suppliers of IBM-compatible mainframes in addition to proprietary systems, "are flexing their muscles and deciding that they're tired of being the power behind the throne," said Donald Bellomy, director of worldwide market studies at International Data Corp. in Framingham, Mass. "They'd like to be viewed as the computer monarchs that, in fact, they are."

Most of Fujitsu's \$16 billion in annual revenue stems from sales of computers and electronic equipment, roughly one-third of Hitachi's \$42 billion sales from computer-related sales.

In the U.S. arena of IBM-compatible mainframe sales, there are only three players: \$60 billion IBM, \$2 billion Amdahl Corp. in Sunnyvale, Calif., and \$1 billion Hitachi Data Systems Corp. (HDS) in Santa Clara, Calif. Fujitsu holds 43% of Amdahl's stock, while Hitachi owns 80% of HDS stock.

Fujitsu recently acquired Britain-based International Computers Ltd. Hitachi distributes its IBM-compatible machines in Europe through Compares GmbH and in Italy through Ing. C. Olivetti & Co. In addition to HDS' European direct-sales force, the other two Japanese suppliers, NEC Corp., sells non-IBM-compatible large systems internationally through Groupe Bull in France.

However, the familiar shape of that global market is slowly but surely changing, posing the possibility that IBM's 80% share of the IBM-compatible world market may slip in the not-too-distant future.

"I expect a slow, steady increase in market share by Hitachi and by Fujitsu, boosting their combined market share from 20% to 30% worldwide," said Mark Hess, program director of IBM large-computer market research at Gartner Group, Inc. in Stamford, Conn.

In Japan, IBM-compatible systems make up just 30% of the installed base. (Installations of Fujitsu's MSP operating system are not included in that figure, although it was originally designed to be compatible with IBM's System 360 architecture.) Market shares shift only slightly from year to year because each vendor depends largely on sales of proprietary operating systems.

The introduction of Unix in Japan, however, would threaten this stable domestic market for Japanese vendors, analysts say.

"About 80% of the mainframe market is made up of replacements, so there is not much chance to change software," Jeremy said. "Open systems should reduce this barrier."

"If the yen strengthens, which it probably will, there will be a tendency for Japanese companies to buy overseas assets, including software companies and venture start-ups," Jeremy said. "Don't expect the Japanese to

become European computer vendors overnight. It will take 10 years to see results. But now is a good time for them to expand."

Indeed, Japanese vendors see a wide-open world market, including opportunities in fast-growing Asian countries and the robust Unix market in Europe. With their proprietary systems customers firmly in hand at home and the Japanese main-

frame market growing at approximately 10% per year, the Japanese are building an infrastructure for overseas markets. This buildup includes hundreds of millions of dollars' worth of investment in research and development labs, field service and software support for overseas customers.

"Up to now, the Japanese manufacturers have made their presence known through minority investments in Western com-

puter companies," said longtime IBM watcher Bob Durdjovic, president of Annex Research in Phoenix. But the competition is, after all, formidable. "IBM is bigger than the next five makers put together," Jeremy said. "So a frontal attack by Japanese makers in the U.S. [would be] useless."

The process of gaining greater market share outside Japan seems inexorable. Fujitsu struck Europe, buying up Britain's ICL. And with General Motors Corp.'s Electronic Data Systems Corp. subsidiary as a 20% partner, Hitachi bought out National Advanced Systems, Inc. in May 1989.

Amdahl, Fujitsu's ally in the U.S. and selected international markets, stressed that it does not release Japanese boxes, preferring to use Fujitsu semiconductors and components in its own designs. But despite

Fujitsu's 19-year relationship with partial ownership of Amdahl, there is no legal restriction against the Japanese vendor selling directly in the U.S. The only caveat is that Fujitsu cannot violate Amdahl/Fujitsu cross-licensing patent agreements for specific jointly developed system features.

Fujitsu Chief Executive Officer Takuma Yamamoto termed the long-standing and close relationship with Amdahl, into which Fujitsu infused \$54 million in capital and loans from 1972 to 1976, as a brotherly one. "In mainframes, Amdahl is playing our main role in the U.S.; they're our brother company," he said.

"We have only a nubole, and this situation will not change over the next five to six years."

Even so, IBM must react to Fujitsu's changed role in Europe and Asia or lose market share. "I don't think there's anything IBM can do over the next five years to stop this," Hess said.

"The only possibility is that IBM pulls together its development and product-development resources so that it's a flawless rollout of significant new function by 1993."

Fujitsu appears to have taken the lead in grinding for this major battle — slightly ahead of HDS, which is using the period from 1990 to 1992 to build up its manufacturing capacity. (See story below.)

In recent months, Fujitsu announced a new mainframe Unix product, UXP/M, which is based on AT&T's Unix System V Release 4 as well as a new high-end eight-processor M-1800 mainframe, which overpowers IBM's top-of-the-line, six-way Enterprise System/9000, although neither system is ready for shipment. Fujitsu is said to be building a new research capability in the U.S. to augment hundreds of Unix researchers at its home offices in Japan.

Although much larger than Fujitsu, Hitachi generates two-thirds of its revenue from sales of basic research, equal capital and consumer products. But Hitachi is building a second mainframe factory in Itoya, Japan, to supplement its Odawara Works site west of Tokyo; it is also building a new disk-drive plant in Orleans, France, scheduled to be completed in 1992. And while HDS customers have complained of disk-drive shortages this year, Hitachi has been dou-

## On the trail

In the U.S., Fujitsu's partner, Amdahl, has established a strong lead in sales of IBM-compatible systems.



Source: Annex Research. U.S. Census Bureau, Nov. 1990

## Fujitsu CEO's global agenda

Software, hiring managers still primary problems for Japanese makers

Fujitsu Ltd. Chairman Takuma Yamamoto met with IDC News Service Bureau Chief Lari Valigra in Tokyo recently to discuss the top Japanese mainframe maker's international strategies. Though Fujitsu sits well positioned through strategic alliances with Amdahl Corp. in the U.S. and ICL in Europe and has made strong moves toward adopting Unix as its open systems strategy, Yamamoto said Japanese companies will not change the global mainframe market equation anytime soon.

Fujitsu introduced two main strategies for mainframes this fall: the UXP/M operating system for high-end mainframes and supercomputers that is based on [AT&T's] Unix System V Release 4 and the top-end M-1800 mainframe, which was announced one day before IBM's Enterprise System/9000. How will these two strategies translate into international mar-

kets, especially the U.S. and Europe?

Fujitsu is promoting open systems fairly actively. We will support small computers through mainframes and supercomputers with Unix and Unix with Japanese-language support.

Amdahl has not decided yet whether it will offer the UXP/M Unix... But Amdahl is developing its own high-end system, so it probably will not sell the M-1800 system in the U.S. or Europe. Fujitsu could market the M-1800 in the U.S. directly, but it will be primarily to Japanese corporations there who are already customers.

What are the major obstacles you face in overseas mainframe markets?

Customer support requirements are different in Western countries [than in] Japan. In Japan, customer requirements for support are very strong. That's why it is hard for foreign manufacturers to enlarge their activities in Japan.

For Japanese manufacturers, the overseas market is difficult

because applications software is based on the culture of the society. But in markets where no support is necessary, for example, in personal computers, we are doing well overseas already. In the future, Japanese mainframe manufacturers will work on support overseas.

We're now in the process of changing from a Japanese company only into a global company. The 80% capital participation in ICL is one of the steps we took to globalize. But software is still the primary problem for Japanese makers trying to internationalize. The other problem is hiring and promoting capable business managers in local operations.

What are Fujitsu's mainframe market priorities over the next five years?

The cost of systems support is rising continually, so we plan to introduce more packaged software applications to reduce software development costs for us and our customers. The other priority is supporting and maintaining our customers' assets in our proprietary systems.

## NEC on the outside

NEC has remained the outsider in the mainframe market with a non-IBM-compatible strategy. Nonetheless, it has managed to win a strong customer base with its own technology.

"NEC started the ACOS mainframe family in 1979 as a competitor to the IBM System/360, and it was very successful," said Takahiko Inoue, vice president of NEC's information processing group in Tokyo.

The company's entrance into the mainframe market was, ironically, sponsored by Honeywell, Inc. Not only did NEC outlast Honeywell, but it owns a minority stake in and is the largest system supplier to BBN Information Systems, Inc., the U.S. subsidiary of Groupe Bull, which encompasses the former computer operations of Honeywell.

"NEC's philosophy is to always pursue an original market for NEC using ACOS, so we have advantages and disadvantages as an IBM competitor," Inoue said. "The advantage is we can use new ideas and special features to improve our mainframes. But with a proprietary system, we cannot use third-party software." To correct that, NEC is also working on developing Unix products in a bid to expand its share of the global large systems market.

In the U.S., NEC has already built up a solid identity in low-end systems and peripherals. And with state-subsidized Groupe Bull under pressure from the French government to resolve its current financial crisis, speculation is rampant that NEC will increase its stake in the French firm.

LOUI VALIGRA



## TRENDS

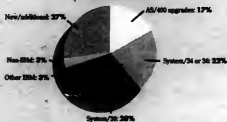
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## Systems being replaced by AS/400s

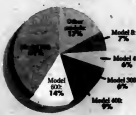
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Most AS/400s have found their way into Systems/38 shops, while 27% have gone to new sites or to their supplementing existing systems

Percent of new-to-order AS/400s  
(dependent base: 1,234)Systems/38 models  
replaced by AS/400s

(U.S. only)

Systems/38 Model 700 users are the largest group to have converted to AS/400s. Being the most powerful Systems/38 model, users needing to upgrade have no other choice but to change product lines

Percent of Systems/38s  
(dependent base: 626)Systems/36 models  
replaced by AS/400s

(U.S. only)

Systems/36 Model 5300 users are also leaning toward the AS/400, particularly the mid- to high-end models, feeling that upgrade options are limited

Percent of Systems/36s  
(dependent base: 243)

Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tim Henshaw

## NEXT WEEK

**S**pecial series: Women in IS. In the last half of the 1980s, some 245,000 computing jobs were opened to women. However, women in IS hold only about 30% of all computing jobs — and far less in IS management. High-level managers such as Mellon Bank Vice President Patricia Farwig are still rare. See In Depth for the first of a two-part series.



Photo: Collection/Photo

**D**ecisions, decisions: Should your organization use systems integrators, outsourcing companies or in-house talent? Manager's Journal takes a look at four companies that faced these decisions and went four separate ways — each reflective of the individual company's own business needs and information systems culture.

## INSIDE LINES

## Everybody's doing it

Not to be outdone by IBM or Unisys, DEC is also getting into data center facilities management. DEC has one outsourcing contract to run a Uniliver DEC-based data center in the UK and is close to signing two similar deals in the U.S., said Tom Mitchell, corporate manager of DEC's Facilities Management Services Group. There are no plans at this point to seek contracts for multivendor data centers, however.

## Time for Snowden?

We've received several calls in recent days from hackers who fear that federal law enforcers are preparing to launch Operation Sundevil II, a large-scale roundup of hackers suspected of carrying out computer crimes. We can't find any evidence to suggest this is true, but it is hard to overlook the fact that the Department of Justice executed Sundevil in early May, only days after Robert T. Morris was sentenced and public attention was still focused on the issue of computer crime. With the recent sentencing of three hackers in Atlanta, one of whom was accused of stealing a document about a 911 system, another raid may be in the offing to take advantage of the publicity.

## Genius flares over Sun policy

Well-known hacker Richard Stallman, the advocate of free software who recently won a prestigious "genius award" from the MacArthur Foundation, is fuming over a Sun Microsystems announcement that would make X View free. The announcement purports to offer the software for free if it is linked with an applications program but Sun would require payment of royalties if the software is included with a computer, Stallman said. "We want to try it with GNU (a Unix clone that Stallman and others at MIT are developing), but X View is not a program we can freely distribute," Stallman said.

## Laptop flash

Hidden among Intel's Comdex/Fall '90 display of 14 prototype 80386SX-based notebook computers was one unidentified notebook object that featured both a 3½-in., 1.44-Mbyte floppy disk and a flash memory card drive. Industry sources say the box was made by Inventra, a Taiwanese OEM with close ties to Intel's Far Eastern group, and is due in the spring.

## Hacker as sports agent

When federal agents raided the dorm room of Adam E. Grant, a student at Georgia Tech University, among the evidence they turned up to incriminate Grant for illegal hacking (see story page 1) was a credit bureau report on Bruce Dukynsky, a former Georgia Tech basketball star. According to government documents filed in the case, Grant tutored Dukynsky, who is now an assistant basketball coach at Georgia Tech.

## Lotus to go

Lotus may lose more than one major 1-2-3 installation to the competition because of its hard-line "one machine, one license" policy. In reply to several letters of complaint, this month's issue of Lotus Magazine published an "editor's reply" reaffirming that users who want to take 1-2-3 home or on the road must first "de-install" the software from their office PCs — or buy a second license. This has caused an IS manager to begin thinking seriously of converting more than a thousand 1-2-3 users to "a vendor that takes a more practical, 'use it like a book' approach to licensing."

**Marketing expertise.** The party's over: for U.S. Robotics, Inc., and that means good news for next year, said Casey Conwell, founder and chairman of the Skokie, Ill.-based modem maker. Conwell told an audience at the seventh annual Illinois High Tech Entrepreneur Awards dinner that the number of hot dogs consumed at Comdex/Fall '90 Monday Night Football party has been an accurate indicator of how the company will fare the following year. Party goers pushed down 20% more dogs this year than last. Dogs may be one apt way to gauge the economy these days, but if you are aware of bright techological lights on the horizon, phone them in to News Editor Pete Barabak at (800) 343-6474, message COMPUTERWORLD on MCI Mail or send a fax to (508) 875-8931.

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